REGIONAL PLANNING

PART III—NEW ENGLAND

JULY - 1936

NATIONAL RESOURCES COMMITTEE

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REGIONAL PLANNING

PART III—NEW ENGLAND

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NATIONAL RESOURCES COMMITTEE

JULY 1936

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NATIONAL RESOURCES COMMITTEE

INTERIOR BUILDING

WASHINGTON

July 7, 1936.

The PRESIDENT,
The White House.

MY DEAR MR. PRESIDENT:

Continuing the series of reports on Regional Planning, we have the honor to transmit herewith our findings and recommendations concerning the accompanying report on planning problems of New England.

This volume constitutes "Part III- New England" of the series of reports on Regional Planning illustrating the variety of background and procedures adopted in different parts of the country. The report, prepared by the New England Regional Planning Commission, illustrates the possibilities of cooperation among state planning agencies for joint attack on interstate problems.

Sincerely yours,

HAROLD L. ICKES
Secretary of the Interior, Chairman

GEORGE H. DERN,
Secretary of War.

HENRY A. WALLACE,
Secretary of Agriculture.

DANIEL C. ROPER,
Secretary of Commerce.

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Secretary of Labor.

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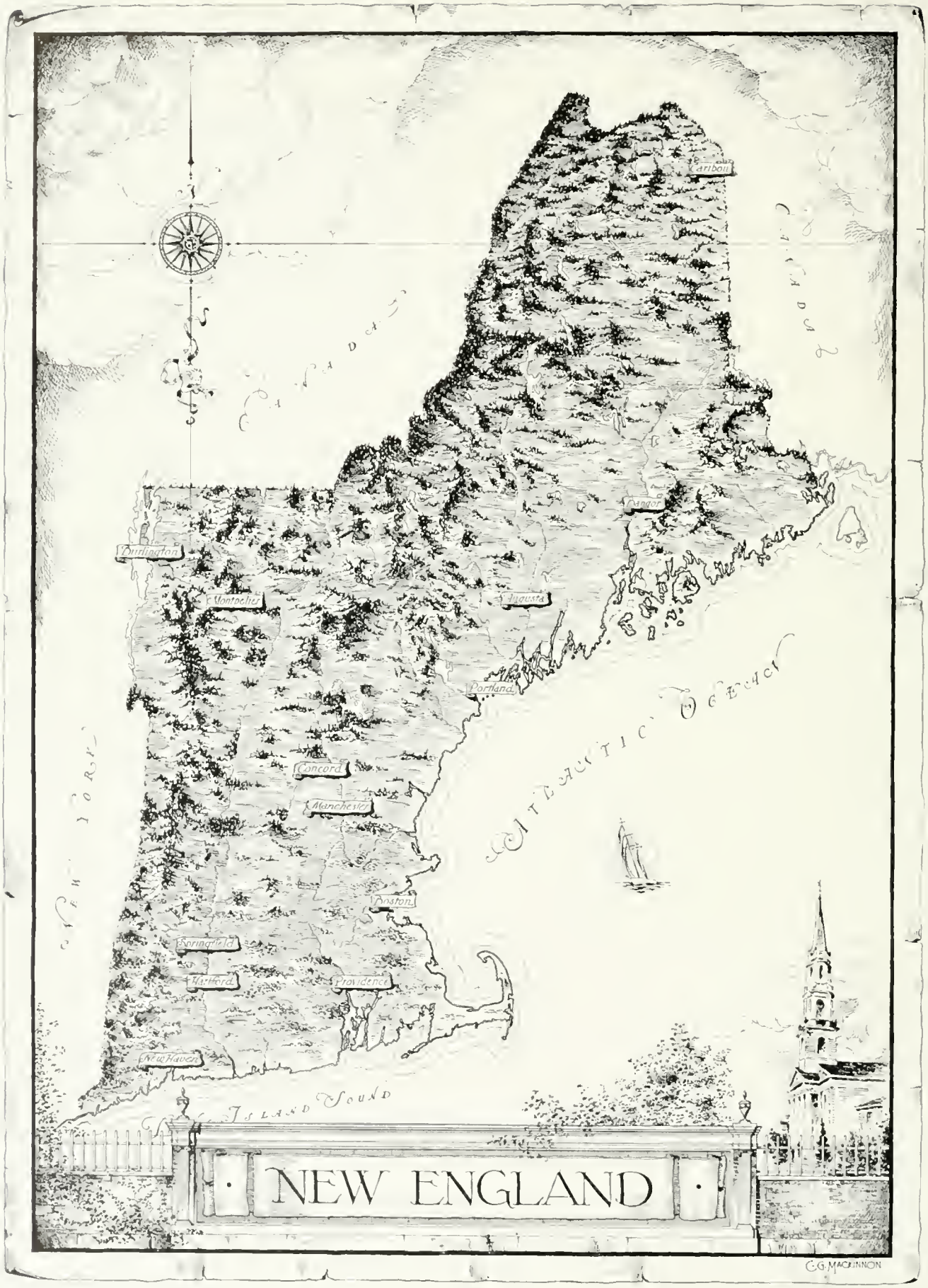
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REGIONAL PLANNING—PART III
NEW ENGLAND

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FOREWORD

RECOMMENDATIONS OF THE NATIONAL RESOURCES COMMITTEE

Foreword.

New England as a region has had a name and has been recognized from the earliest days of its settlement to the present time. New Englanders have thought of themselves and been thought of as coming from a distinctive part of the country. It is not only in this sense of public recognition of the fact, but also in the long history of intercolony and interstate cooperation among the New England States that we find evidence of regional unity. From the days of the New England confederation, organized to fight King Phillip and the Indian wars, through the changes and vissicitudes of time, the New England States have repeatedly stood together and worked together for their joint advance.

In more modern times, as individual problems have arisen, groups have been formulated from the several New England States to make a joint attack on issues involving the welfare of the entire region. Thus, in 1920, through leadership of James J. Storrow, the New England States presented a united front in the question of reorganization of the railroad facilities of the country and urged a regional basis for ownership and operation of railroad facilities in New England. In 1924 a group of people interested in planning for the whole of New England first met at the call of the Massachusetts Federation of Planning Boards. A year later, the New England Council was organized through the efforts of Chambers of Commerce and interested citizens. Since that time, the Council has made a series of comprehensive studies of the industrial problems of New England and has focused attention on the diversification of industries and recreational possibilities of the area. Through the Council and other agencies, a series of meetings of the six New England Governors have been held at frequent intervals for almost 10 years at which problems of interstate jurisdiction and cooperation have been discussed and common lines of action agreed upon. Without the formality of interstate compacts or any written agreements, a cooperative spirit has been engendered, and much has been accomplished for the benefit of all six States.

It is not surprising, therefore, that out of this background of regional action, a New England Regional Planning Commission came into being early in 1934. The interest of the New England Council was manifested at its annual convention in November 1933. The official designation of members by each of the New England Governors and the assignment of Consultants by the National Planning Board of the Public Works Administration set the new agency on its feet.

Like the companion organization in the Pacific Northwest at the opposite end of the continent, the New England Regional Planning Commission is composed of the Chairmen of the State Planning Boards in the area together with the District Chairman of the National Resources Committee; but in the case of New England, additional citizens from private life have been added to the Commission. This coordinating organization, with offices in Boston, works through the State Planning Boards and with the consulting staff of each of the separate State agencies. Since all of the New England States now have legislation establishing State Planning Boards on a permanent basis, the regional office can serve a particularly useful purpose as a clearing house of information and in order to fill in gaps in the work which overlap State lines.

Supplementing the official organizations, the Regional Planning agency has set up an advisory committee of some five hundred citizens with whom it keeps in constant touch through the press, bulletins, and meetings in all parts of the area. Through this committee and through the cooperation of a large number of existing private agencies which are active in more than one State, public opinion can be easily ascertained by the planning group.

The Planning Commission has embarked on an ambitious program of studies and planning to improve the physical environment of the eight million people who live in the unusually densely populated 62,000 square miles of the area. In contrast to the Pacific Northwest, the generally dense population of New England makes the regional problem a natural outgrowth of the city and metropolitan planning studies of previous years. The New England Commission has sought to provide for this community of closely related urban areas plans for a coordinated system of transportation, programs for more adequate recreational facilities, and plans for the conservation and development of land, water, and wildlife resources.

Through a series of technical committees, much progress has already been made in each of these fields as shown by even the most casual reading of the

accompanying report. The recommendations of the New England Commission concerning these matters are consistent, conservative, and well conceived. In practically every case, they follow closely, but with local application, the principles laid down in previous reports of this Committee. They emphasize the importance of decentralized action by the people most concerned, but with cooperation and coordination through voluntary and advisory planning agencies.

Perhaps the most significant progress in the planning for New England discussed in the report is the record of legislation passed during the last 2 years by the separate States. New interest in the whole conservation program for natural, industrial, and human resources is clearly evident, and appreciation and understanding of the service to be rendered by advisory planning agencies is fully appreciated. The natural development of the planning field from long experience with village improvement organizations, town and city planning commissions, has made the New England States familiar with the meaning and purpose of planning work and convinced them of the necessity of a continuing interstate regional planning organization.

A distinctive feature of the New England planning situation is the desire and emphasis of the regional planning agency to secure action for the execution of plans by State and interstate authority. The whole report of the New England Commission indicates the strength and vigor of local feeling and the desire to do things for themselves rather than to depend upon Federal authority or Federal money. This independence of thought is entirely consistent with the decentralization policy adopted by the National Resources Committee in its stimulation and encouragement of State and regional planning.

RECOMMENDATIONS

On the basis of the findings and principles outlined in the report of the New England Regional Planning Commission and the foregoing summary of the accompanying report, the National Resources Committee recommends:

(1) *Continuous Regional Planning.*—That a continuous regional or interstate planning activity and planning organization for New England should be provided through cooperation of State Planning Boards and Federal officials in the area and through continued Federal financial assistance. Assistance should be given to the Regional Planning Commission in the form of technical consultants and emergency personnel as at present, or by the loan of Federal personnel, or by other appropriate ways and means.

(2) *Interstate Compacts.*—That encouragement and assistance be offered to the New England States in the negotiation and approval of interstate compacts to provide executive agencies and financial support not only for continued planning work, but also for the financing and execution of plans. It is recommended that appropriate Federal representation should be provided on regional agencies established through such interstate compacts.

REPORT OF THE

NEW ENGLAND REGIONAL PLANNING COMMISSION

JULY 1936

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NEW ENGLAND REGIONAL PLANNING COMMISSION

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Victor M. Cutter, district chairman, National Resources Committee, chairman
William L. Slate, chairman, Connecticut State Planning Board
Samuel Stewart, chairman, Maine State Planning Board
Elisabeth M. Herlihy, chairman, Massachusetts State Planning Board
James M. Langley, chairman, New Hampshire State Planning and Development Commission
John Nicholas Brown, chairman, Rhode Island State Planning Board
Frederick W. Shepardson, chairman, Vermont State Planning Board
Mrs. Charles Sumner Bird, member-at-large
Frederic H. Fay, member-at-large

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Joseph T. Woodruff, consultant, New England Regional Planning Commission and Connecticut State Planning Board, chairman
Frederick P. Clark, associate consultant, New England Regional Planning Commission
Arthur C. Comey, consultant, Maine State Planning Board and Massachusetts State Planning Board
Alfred Mullikin, associate consultant, Maine State Planning Board
Justin R. Hartzog, consultant, New Hampshire State Planning and Development Commission
John H. Cady, consultant, Rhode Island State Planning Board
John Nolen, consultant, Vermont State Planning Board
Philip Shutler, associate consultant, Vermont State Planning Board

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Sanford H. Wadhams, director, State Water Commission, Connecticut
James L. Bryne, consulting engineer, Maine
Arthur D. Weston, chief engineer, Department of Public Health, Massachusetts
George G. Shedd, consulting engineer, New Hampshire
O. Perry Sarle, consulting engineer, Rhode Island
Perry H. Merrill, state forester, Vermont

Aviation Committee

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Dr. Jerome C. Hunsaker, professor in charge of Daniel Guggenheim Aeronautical Laboratory, M. I. T.
Harold B. Richmond, consulting radio engineer, Boston
Lt. Richard E. Cobb, United States Army, Air Corps, First Corps Area
Lt. Howard L. Jennings, United States Navy, Commanding Officer, Naval Reserve Aviation Base, Squantum, Massachusetts
Hervey F. Law, district adviser, United States Bureau of Air Commerce
Charles L. Morris, commissioner of aeronautics, Connecticut
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Lt.-Col. Stedman Shumway Hanks, Committee on Aeronautics, Massachusetts
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Daniel J. Kiely, chief, Division of Airports, Rhode Island
Frederick W. Shepardson, chairman, Vermont State Planning Board

NATIONAL RESOURCES COMMITTEE
OFFICE OF DISTRICT CHAIRMAN

NEW ENGLAND REGIONAL PLANNING COMMISSION,
2100 FEDERAL BUILDING,
Boston, Mass., February 5, 1936.

HON. HAROLD L. ICKES,
Chairman National Resources Committee,
Interior Building, Washington, D. C.

DEAR SIR: We have the honor to transmit herewith the report of the New England Regional Planning Commission called for on December 3, 1935.

The form and content of this report have been limited by the short space of time allotted for its preparation. The Commission, nevertheless, believes that it contains significant facts.

In October 1934 it was reported to the National Resources Board that the New England planning problem was twofold—the preparation of preliminary and flexible plans for regional problems in New England and the coordination of the separate State plans into a complete pattern for the region.

It has been a continuing policy of the Commission studiously to avoid duplication of effort or interference with planning in any individual State. It was clearly recognized by the Commission that, if town, city, metropolitan, county and State plans were to precede regional planning, the delay in preparation of regional plans would be considerable. Nevertheless, the Commission felt that the benefits of this procedure would be greater than the disadvantages.

The Rhode Island and Massachusetts State planning boards have been established within the year. Therefore information, studies and plans for these areas of New England are as yet largely unavailable for use in regional planning. The Commission has therefore concentrated on projects of purely regional nature pending the completion of State plans. The accompanying report clearly indicates the status of planning in New England.

Appended to this report of the New England Regional Planning Commission is a staff report outlining our various activities and the data on which future plans will be based.

Very respectfully yours,

VICTOR M. CUTTER, *Chairman,*
New England Regional Planning Commission.

WILLIAM L. SLATE, *Connecticut.*
SAMUEL STEWART, *Maine.*
ELIZABETH M. HERLIHY, *Massachusetts.*
JAMES M. LANGLEY, *New Hampshire.*
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FREDERIC H. FAY, *Member-at-large.*

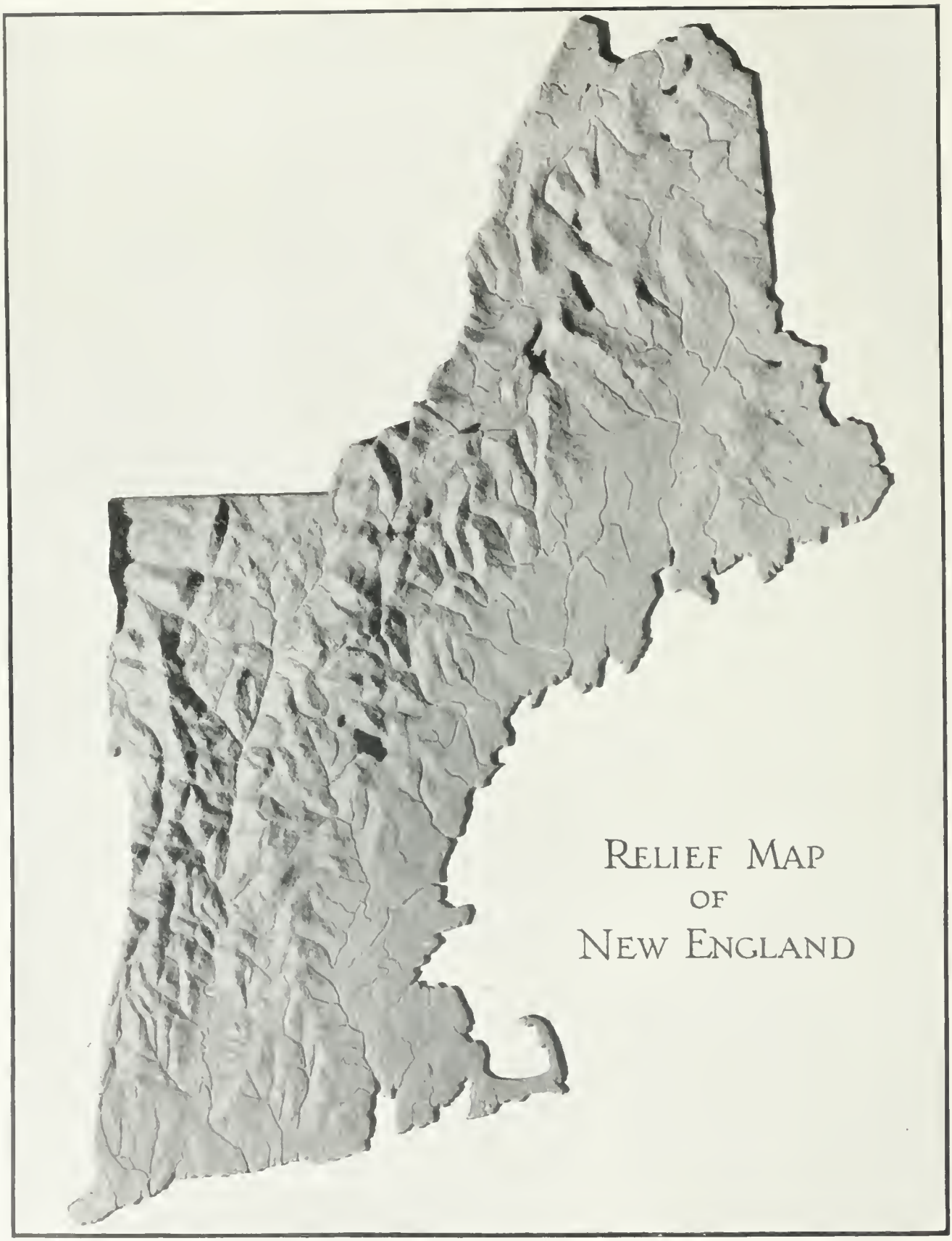


Figure 1

REPORT OF THE NEW ENGLAND REGIONAL PLANNING COMMISSION

While New England has long been recognized, both within and without the region, as a natural economic area, only in recent years has any marked progress been made toward the study and solution of its problems on a regional basis. Divided into six separate and sovereign States by political accident rather than by plan, it has been difficult for New England to organize for cooperation and to develop either data or organization on regional as well as State bases. Trained politically for many generations in the town-meeting system, the people of New England have been slow to sacrifice direct participation in government for the advantages of cooperative action on a State or regional basis.

Extension and centralization of governmental authority have developed in New England as elsewhere, but both have been steadily resisted. Often characterized as inflexible and conservative, New England has nevertheless developed and maintained a high degree of prosperity through successive eras of preeminence in forestry, agriculture, foreign trade, fishing, and manufacturing, and is now on the threshold of a readjustment of its industries in many new fields of activity, including the development of the countryside as a recreational area.

In early days, when nearly every New England community was self-sufficient and communication with other than nearby neighbors was difficult, no consideration was given to planning for New England as a region. The increasing complexity of the modern economic structure has destroyed the economic self-sufficiency of communities and States so that today New England feels the impact of economic activities all over the world. Consequently each town, city, and State recognizes the need of cooperation to insure its own economic welfare.

One of the earliest indications of interest in regional planning for New England was in October 1924, when the Massachusetts Federation of Planning Boards called representatives of official and unofficial planning organizations in New England to a conference in Boston for the purpose of discussing cooperation in planning for the region.

The New England Council, formed in 1925, composed of business leaders from each State, made the first comprehensive studies of New England as an industrial area, and it has continued its activities over a constantly widening field. The Council anticipated the functions of a planning body and has given regional planning its full cooperation.

In 1929 a conference of representatives appointed by the six New England governors met in Boston and formed the first planning organization, which was called the New England Regional Planning League. The expressed purpose of the league was "to foster the study and practice of planning as applied to New England as a whole."

Formation of Commission

Thus when the Federal Government in 1933, through the National Planning Board, made available its assistance in conducting State and regional planning activities, New England was one of the first sections of the country to organize.

On March 2, 1934, representatives of the New England governors met in Boston and organized the New England Regional Planning Commission "to establish a permanent body for the coordination of planning effort in the several New England States and for the making of basic regional studies for this area."

The first Northeastern Planning Conference was held, at the invitation of the then Governor Winant, in the New Hampshire State Capitol exactly 1 month later, and to it came representatives of State departments, local, State, regional, and Federal planning organizations throughout New England. Frederick A. Delano, chairman of the National Planning Board, presided, and various speakers presented their concepts of the goal of planning and the place of an interstate regional planning organization in the fulfillment of that purpose.

James M. Langley, chairman of the New Hampshire State Planning Board, first to be appointed in the United States, stated at that meeting: "In formally entering upon planning activities the State contemplated establishment of a New England Regional Planning Board, and the Governor has designated a New Hampshire representative on that board. The State hopes for full cooperation of all the New England States in this regional board because so many New Hampshire problems are related to those of the neighboring States. The evolution of an organized and more enlightened individual freedom must presumably proceed from cooperative planning, and that is what we in the Granite State desire."

The Honorable Stanley Wilson, then Governor of Vermont, emphasized the conservatism of his State, but stated that now they were convinced of the value of State and regional planning. He said: "In the past 3 years Vermont has more and more acquired the habit of teaming with her sister States, and good cooperation has been effected on problems that are New England regional problems."

Frederic H. Fay, appointed by ex-Governor Ely as the Massachusetts member of the Regional Planning Commission, stated for record that Massachusetts "will cooperate with the New England Regional Planning Board for the good of the country at large."

"There are," said John H. Cady, appointed by Governor Green as the Rhode Island member of the Regional Planning Commission, "no natural boundaries between Rhode Island and Massachusetts, and it is therefore impossible to conceive of any plans for the State without considering the neighboring plans."

A resolution adopted by the Connecticut State Planning Board at its meeting on March 29, 1934, was read by George H. Gray, then consultant to the board. It stated that "the Connecticut State Planning Board is of the opinion that a New England regional planning organization should be permanently established as soon as possible so that the interrelated problems of the several States may be jointly studied, and to that end hereby pledges her active cooperation in such a regional planning board insofar as her resources permit."

Governor Brann, of Maine, said at a meeting in Montpelier, marking the organization of the Vermont State Planning Board, that he approved of regional cooperation in planning for New England as a whole, and said that it was the responsibility of these States to build up their great resources for the benefit of the entire people of the Nation.

Thus was pledged the support of the New England States to a cooperative planning effort. From that day there has been a hearty spirit of cooperation in State and regional planning activity in New England. Once a month the chairmen of the six New England State planning boards meet as a commission for free discussion of their own and regional problems.

The concept of the meeting which organized the New England Regional Planning Commission was that the commission should—

1. Be nonpartisan.
2. Have a representative from each State planning board.
3. Be permanent and provide for continuous review and revision of its plans.
4. Have a program of activities comprehensive in scope.
5. Concern itself with physical planning and study social and economic factors to determine their relation to and effect on the physical plans.
6. Provide opportunity for local interest and civic organizations to participate in cooperation with the State planning boards in forming a New England plan.
7. Be an organization separate and apart from administrative and construction agencies.
8. Coordinate State plans.

Organization

The Commission includes one representative from each State, the chairman of the State planning board. The regional chairman of the Commission is a New England citizen, suggested by the Commission and appointed by the National Resources Committee. This provides adequate contact with national planning activities. There are, in addition, two members-at-large appointed by the chairman with the advice and consent of the Commission. At present there is no direct Federal participation in the activity of the Commission other than that of the chairman.

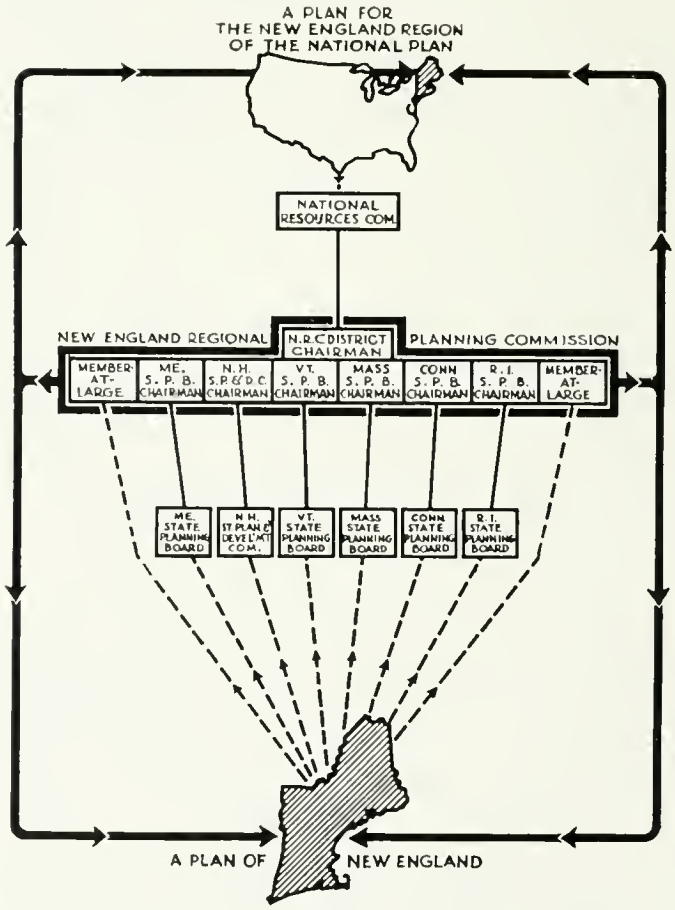


FIGURE 2

The Commission established an advisory committee to utilize to the fullest extent the combined intelligence of all New England organizations, both public and private, interested directly or indirectly in the planning for and development of New England. It is composed, at present, of more than 500 New England citizens representative of governmental and civic organizations, industry, and the professions. This committee has given definite assistance through criticism and suggestions regarding the policies and programs of the Commission. Another valuable contribution of the advisory committee is in the interpretation to their local communities of the nature and objectives of regional planning.

The New England Regional Planning Commission has adopted a policy of appointing from time to time, as need arises, special technical committees to deal with specific problems.

The Commission is assisted by consultants and a small staff of technical assistants. Also each State planning board has the services of planning consultants assigned by the National Resources Committee. These State consultants, together with the regional consultants, advise the Regional Planning Commission on technical planning problems.

Procedure of Commission

It is recognized that the preparation of a broad regional plan for New England must be preceded by the collection, interpretation, and correlation of a vast amount of data and that it is impossible to formulate sound plans without full knowledge and consideration of basic facts. Regional planning, therefore, is essentially a long-term activity. The vast sums of money normally spent for public works, as well as increased amounts called for by an emergency like the present, make imperative the preparation of sound plans to serve as a guide under normal conditions. Such plans will, in case of future emergencies, prove of exceptional value in indicating projects of merit and the methods by which they may be most economically completed. Continuous planning will provide a basic and flexible plan for the future of the New England region.

The procedure followed by the Commission in preparing plans of a broad regional character is:

1. On authorization by the Commission, the chairman appoints a technical committee of outstanding New England men informed on the specific project under consideration.

2. This technical committee prepares a program of study. This program is submitted to the Regional Planning Commission which, with the advice of the consultants, adopts the program with such changes as are deemed advisable.

3. As amended and approved, the regional staff secures and puts into usable form the basic data on this specific subject according to the program developed by the technical committee.

4. The technical committee, after thorough examination of all the data prepared by the staff, makes recommendations to the Regional Commission.

5. The Regional Commission, with the suggestions of the board of consultants, submits its report to the several State planning boards for their criticism, suggestions, and approval.

6. The State planning boards then return the report to the Regional Commission.

7. The Regional Commission takes final action on the report and, if adopted, the plan outlined in the report becomes a part of the tentative New England plan. This plan is adapted and fitted to the other component parts of the tentative comprehensive plan, and is revised from time to time on the basis of most recent data.

Program of Commission

The basic regional plan for New England includes:

1. A plan for a coordinated system of all forms of transportation.

2. A plan for the conservation and development of interstate water resources.

3. A program for better land utilization.

4. A program for conservation of forests and wild life.

5. A program for development of recreational facilities, including interstate reservations, parkways, foot and bridle trails, and other facilities.

6. A program of legislation necessary to make effective the plans formulated.

7. Economic, social, and other studies dealing with specific subjects such as population trends, industry, and housing, which may be essential in formulating the basic regional plan.

Status of Program

Population trends.—A preliminary population study has been prepared by the staff and reviewed by several advisory committee members already engaged in population research. This study is being continued and a report will be issued in March.

Agriculture and land use.—The Commission has prepared an extensive bibliography on land utilization studies relating to New England, a report on the present status of soil and land-use surveys in New England, and a graphic presentation of the more

important facts regarding agricultural and land-use trends in New England.

Forestry.—All available studies of New England forestry are being assembled for use by a technical forestry committee, to be appointed.

Recreation.—The Commission is securing the basic data necessary for consideration of recreational needs and problems, and has prepared studies of—

1. Publicly owned lands, especially the numerous State parks and forests which have been developed for recreation as well as forest conservation, watershed protection, and wildlife preservation.

2. Foot trails and bridle trails, with regard to the extent of present facilities and the possibilities of coordination into a New England trails system.

3. Winter sports facilities now being developed upon realization of New England advantages and possibilities in this field.

4. The possibilities of coordinating fish and game laws in the New England region.

The Commission is cooperating with the National Park Service, the State conservation and development commissions, the New England Council, and other organizations active in the recreational development of New England.

The appointment of a technical recreation committee has been authorized, and a report on existing recreational development is being prepared for its use.

Water resources.—1. A water resources conference was held on March 22, 1935, the results of which pointed conclusively to the need for comprehensive study of interstate streams in New England. The conference passed a resolution requesting the appointment of a technical water resources committee to advise and guide the Commission.

2. A water resources committee was appointed and has—

(*a*) Prepared a comprehensive outline for use in water resources investigations.

(*b*) Studied pending congressional bills providing for the establishment of Federal valley authorities to deal with Connecticut and Merrimack River valley problems.

(*c*) Studied the comparative merits of interstate compacts and Federal authorities for the conservation and development of New England interstate water resources.

(*d*) Reported in favor of the interstate compact method; has submitted drafts of necessary enabling legislation; and has suggested forms for interstate compact agreements. These are now being studied by the Commission.

3. A bibliography on water resources data has been prepared and made available to the water resources committee and to the State health department engineers of New England.

4. Following advice of the water resources committee that much hydrological data necessary for making a comprehensive study of the Connecticut River basin is not available, the Commission prepared a project for securing this data and, through the cooperation of the four State planning boards concerned, the project is now under way.

5. By utilizing available data, preliminary reports on existing conditions in the Connecticut, Merrimack, and Blackstone River basins have been prepared for the use of the water resources committee.

6. The Commission has obtained the advice and counsel of advisory committee members living in the drainage basins of the Connecticut, Merrimack, and Blackstone Rivers, the principal interstate streams, on the important problems of their respective river basins.

7. A summary of the pollution problem in New England has been prepared in cooperation with the State planning boards.

8. A special study of pollution in the Connecticut River above Hartford, Conn., has been made in cooperation with the Springfield, Mass., city planning board.

Industry.—1. Data has been assembled and a preliminary study prepared on the more important facts and trends of New England industry. Especial attention has been given to the location and relative importance of principal industries, and the trends of production and employment in major types of industry.

2. A study showing the distribution of economic activities in New England was prepared at the request of the Federal Reserve Bank of Boston.

3. A survey of vacant industrial properties throughout New England is being made in cooperation with the New England Council.

Highways.—1. A study of the available basic facts regarding New England highways and motor traffic has been prepared.

2. A preliminary study of a New England motorways system has been prepared and is being reviewed by the State planning boards and their consultants.

3. A study of the location of the New England portion of the proposed highway from Boston to Washington has been prepared. Copies of this report were sent to the State planning boards, the National Park Service, and the Bureau of Public Roads.

4. An illustrated booklet entitled "Limited Motorways" showing the features of modern arterial-highway design, has been prepared. This was published by the New England Council and has been widely requested and used.

5. At the request of the Commission, the Bureau of Public Roads made a special study of legislation per-

mitting State highway commissioners to build highways of limited-way or free-way design. The Commission has prepared copies of this study and distributed them to interested agencies throughout the country.

Railroads.—1. A bibliography of available studies of New England railway consolidation has been compiled.

2. A study of the major facts concerning railroad development and traffic in New England has been prepared.

3. A study is being made of a uniform method of recording grade-crossing data. The program of Federal grade-crossing elimination during 1935 brought out the need of more complete data and a more uniform method of recording it in order that the relative importance of grade crossings may be determined.

4. A study has been made of the comparative importance of the major New England grade crossings from the standpoint of railroad-highway traffic conflict. This study was transmitted through the National Resources Committee to the Bureau of Public Roads.

5. A study of existing grade-crossing legislation in New England has been prepared.

Aviation.—1. A technical aviation committee has been appointed to develop an aviation program for submission to the Commission.

2. A comprehensive report on present aviation facilities and problems has been prepared for use by the committee.

Public relations.—The Commission has maintained close contact with New England opinion and has kept New England informed of the development of planning programs through the following channels:

1. The Advisory Committee. This group of more than 500 New England citizens is one of the most important factors of the New England planning organization.

2. The New England Planning Bulletin. This monthly publication keeps the advisory committee and State planning boards informed of planning activity in this region and of events having special significance to New England planning.

3. A progress report, "Basic Data for a Tentative and Preliminary Plan for New England." This has had wide distribution.

4. Preparation, at the request of the New England Council, of a statement of objectives for New England and presentation of the subject, "State and Regional Planning in New England" to the New England governors and the tenth New England conference in Boston, November 21–22, 1935.

5. Cooperation with the New England council in the preparation of "New England Today", a publication giving the salient facts concerning the region and the trends in its development.

6. A colorful and interesting exhibit showing the nature and scope of the Commission work. This has been made available for exhibition throughout New England.

7. Frequent public speaking engagements of the chairman and the consultants.

Interagency relations.—The Commission has also cooperated with local, State, and Federal agencies, as well as with civic organizations. The following specific examples will indicate the nature of this cooperation: assistance to the National Park Service in preparing a map of New England recreational areas; preparation of requested data concerning New England for the Resettlement Administration; submission of a New England grade-crossing study to the Bureau of Public Roads, the agency which directs the Federal grade-crossing-elimination program. There has been continual cooperation and mutual exchange of information with the State planning boards. The need of such service was a fundamental reason for organizing the Commission.

General.—1. A survey of local planning agencies in New England is being made in cooperation with the State planning boards. During the past 2 years there has been a great increase in the extent of local planning activity.

2. The Commission has aided in securing passage of State planning legislation in the New England States, every one of which now has an official planning board.

3. The Commission has endeavored to secure greater uniformity in the graphic presentation of planning information, and has submitted to the State planning boards a recommended chart of map symbols. This chart is being used by the National Resources Committee in preparation of uniform procedure to be recommended as standard throughout the country.

4. Much material prepared by the Commission has been sent upon request to interested agencies and individuals.

Acknowledgment

Acknowledgment is made to the National Resources Committee for its support and cooperation, and to the Civil Works Administration, the Emergency Relief Administration, and now the Works Progress Administration for furnishing personnel. The New England Council aided substantially in bringing about the organization of the Commission, and has continued to lend assistance. Members, staffs, and consultants of the individual State planning boards have helped to carry out the program of work; and many agencies and individuals, public and private, have wholeheartedly contributed their efforts in behalf of planning in New England.

Recommendations

The New England Regional Planning Commission recommends at present that:

1. The six States constitute the New England planning region.

2. The Regional Planning Commission be continued as a permanent part of planning organization in New England.

3. The general studies and collection of data for New England as a whole be carried on continuously and consistently.

4. Local, State, regional, and Federal plans for New England be coordinated.

5. Planning be decentralized, so far as possible, with cooperative participation by town, city, intrastate regional, State, regional, and national planning agencies.

6. There be a study of Federal and State participation or cooperation in regional planning.

7. There be established a permanent national planning board, advisory in character.

The New England Regional Planning Commission further specifically recommends that:

1. Land-use and soil surveys be extended throughout New England by the several State planning boards by cooperation with all agencies now engaged in this work.

2. A program be initiated for the further extension of scientific forestry so that New England can more nearly meet her own demands for lumber and pulp and make possible (*a*) better utilization of farm wood lots and forests, and (*b*) the establishment of wood-using industries in rural areas having little or no other means of livelihood.

3. Studies be made by State planning boards as to necessary adjustment of taxation of forest land to encourage private enterprise on a sustained-yield basis, such studies to be coordinated by a regional forestry committee.

4. The New England States, following the example of New Hampshire and Vermont, study and establish definite policies in regard to public land acquisition by Federal, State, and local authorities.

5. A study be made to determine the extent to which public and private recreational facilities may supplement rather than compete with each other.

6. The New England States plan for the preservation of outstanding historic, scenic, scientific and geological landmarks.

7. Study be made, by the several State planning boards with the cooperation of existing State agencies, of coordination of fish and game laws to preserve wildlife for the benefit of both sportsmen and conservationists.

8. The Regional Planning Commission, in collaboration with the State planning boards, prepare a comprehensive transportation and communication plan.

9. State legislation be instituted permitting State highway commissions to build limited motorways, freeways, parkways, and other modern types of highways.

10. A periodical origin and destination traffic survey be made for New England as a whole by the United States Bureau of Public Roads in cooperation with the State highway commissions and other appropriate agencies.

11. The interstate water resources of New England be conserved and developed by interstate compacts and a program be developed by the State planning boards and Regional Planning Commission to deal with pollution, navigation, flood control, and other problems of interstate lakes, streams, and tidal areas.

New England Regional Planning Commission.

V. M. Cutter, *Chairman.*
William L. Slate, *Connecticut.*
Samuel Stewart, *Maine.*
Elisabeth M. Herlihy, *Massachusetts.*
James M. Langley, *New Hampshire.*
John Nicholas Brown, *Rhode Island.*
Frederick W. Shepardson, *Vermont.*
Anna C. Bird (Mrs. Charles Sumner Bird), *Member-at large.*
Frederic H. Fay, *Member-at-large.*

STAFF REPORT
INTRODUCTION

The major features of the regional plan for New England include:

1. A plan for a coordinated transportation system comprising highways, railroads, airways, and waterways;

2. A plan for the conservation and development of interstate water resources, most important of which are the Connecticut, Merrimack, and Blackstone Rivers;

3. A plan for (*a*) the preservation of outstanding natural, scenic, and historic features of the region; (*b*) the development of interstate areas and facilities necessary for conservation and recreation.

It is recognized that the preparation of such a regional plan for New England involves the continuous collection, interpretation, and adjustment of material, and is, therefore, essentially one of long-term effort.

However, it is possible to show a plan representing the best combined thought, at any given date, of all agencies concerned. Such a plan should be diagrammatic in form and tentative in character. As individual State planning boards progress in their work, bringing it constantly in closer relation to local detail and local considerations, that portion of the regional diagram covering any one State must be modified. In like manner, as additional information concerning the region and the country at large is obtained and sifted, the regional diagram must be altered.

Such a tentative plan is, from the very nature of its construction and the way in which it has been reviewed and criticized, a long step forward, and of great value in the formulation of more advanced plans. The steps involved in its preparation are:

1. Assembly in diagrammatic form of all units of the comprehensive plan, being guided by significant facts, trends, and forecasts of physical, economic, and social conditions crystallized from assembled data;

2. Study of this diagrammatic plan by the State planning boards, the board of consultants, and special technical committees in the light of local intelligence and experience;

3. Adjustment of the plan according to pertinent criticism;

4. Adoption as part of tentative New England plan;

5. Revision from time to time, based on more recent information and more nearly complete data.

Specific diagrams relating to motorways, airways, and public reservations, and maps showing conditions and programs dealing with water supply, pollution, navigation, flood control, power, recreation, and existing and potentially desirable land uses on the major interstate river basins have been prepared and are under constant study and adjustment through the foregoing process. At any one time the coordinated assembly of the above-mentioned diagrams constitutes the current tentative regional plan for New England.

The constant study, adjustment, and improvement of the above plan in the light of more recent and detailed information is a continuing activity of the New England Regional Planning Commission.

The staff report, which follows, contains brief statements summarizing the assembled material and the present status of study of each aspect of the plan. As work of the State planning boards progresses and is correlated by them with local planning effort, much additional data will become available for use in the wise adjustment of the New England regional plan.

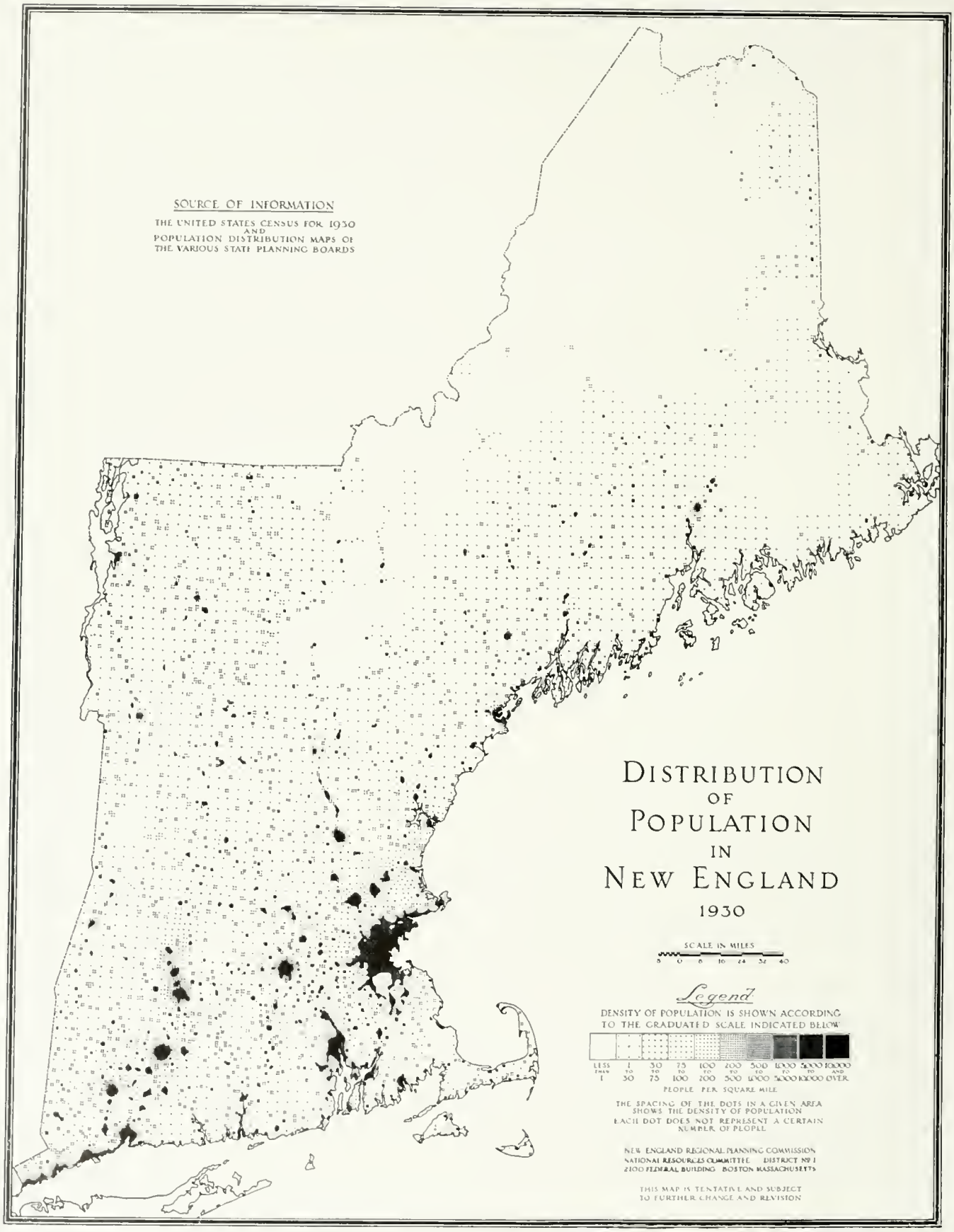

SOURCE OF INFORMATION
THE UNITED STATES CENSUS FOR 1930
AND
POPULATION DISTRIBUTION MAPS OF
THE VARIOUS STATE PLANNING BOARDS
DISTRIBUTION
OF
POPULATION
IN
NEW ENGLAND
1930
SCALE IN MILES
0 0 8 16 24 32 40
Legend
DENSITY OF POPULATION IS SHOWN ACCORDING
TO THE GRADUATED SCALE INDICATED BELOW
LESS THAN 1
1 TO 30
30 TO 75
75 TO 100
100 TO 200
200 TO 500
500 TO 1000
1000 TO 5000
5000 TO 10000
10000 AND OVER
PEOPLE PER SQUARE MILE
THE SPACING OF THE DOTS IN A GIVEN AREA
SHOWS THE DENSITY OF POPULATION
EACH DOT DOES NOT REPRESENT A CERTAIN
NUMBER OF PEOPLE
NEW ENGLAND REGIONAL PLANNING COMMISSION
NATIONAL RESOURCES COMMITTEE DISTRICT NO 1
2100 FEDERAL BUILDING BOSTON MASSACHUSETTS
THIS MAP IS TENTATIVE AND SUBJECT
TO FURTHER CHANGE AND REVISION

FIGURE 3

STAFF REPORT—SECTION I
POPULATION

Foreword

The object of planning is to provide for the needs of people, both present and future. Without an understanding of the number, characteristics, and distribution of the people, present needs cannot be evaluated in terms of highways and transportation, school facilities, recreational areas, industrial development, housing, and other fields of private and public planning. Future needs in these fields obviously cannot be evaluated without some estimate of the same factors.

It is therefore important to trace the growth and development of New England's population, and to note the forces behind the various trends. This involves study of the number of people, their distribution, origin, ages, and fields of occupation. With this foundation we can more clearly understand the trends to the present, and interpret, within our limitations, trends into the future.

New England, comprising only 2.1 percent of the continental United States, or 62,000 square miles of land area, contains over 8,000,000 people (nearly 7 percent of the United States population). Less than 40 percent of the New England inhabitants are native white of native parents, as compared with 57 percent for the United States. The population varies widely in density, between 5 persons per square mile in the forest areas and 16,000 per square mile in the county of greatest concentration. The average density is about 130 persons per square mile, or three times that of the United States. According to census classification, about three-fourths of the people live under urban, and less than one-fourth under rural conditions. The population is predominantly industrial, with 45 percent of the wage earners engaged in manufacturing industries and less than 10 percent in agriculture.

This analysis of the New England people is from the regional point of view. The population problems of the States comprising the region have been and will be studied by the individual States. They have made investigations of distribution, characteristics, and trends within their borders; some have studied particular problems. Vermont, for example, has given attention to the contributing causes of population shifts in its towns. New Hampshire, in addition to appraising conditions shown by census reports, contemplates a more detailed study of its people. Connecticut has under way a study of population and its trends for the period 1930–34. Massachusetts has

Photo by courtesy of New England Council

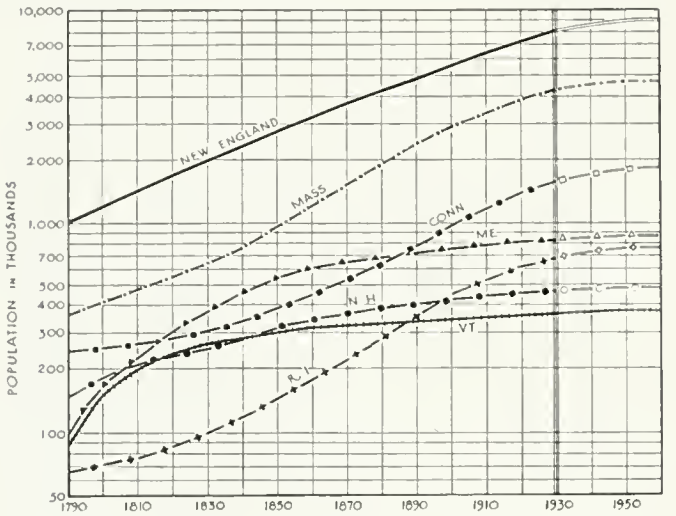
FIGURE 4.—City Street Scene—Boston.

Photo by courtesy of New England Council

FIGURE 5.—Village Scene—Plymouth, Vermont.

added to the statistics of the 1930 census by taking a population count in connection with a 1934 unemployment census in addition to its usual mid-decade census in 1935. Such State studies provide a background for a picture of New England as a unit.

The size and composition of the future population of this region will be determined by the forces that control the population of the entire country (births, deaths, and foreign immigration), with the additional factor of internal migration. Whether the region's population volume rises, stabilizes, or declines will have a far-reaching effect on many phases of New England life. Changes in the number and distribution of people will affect industrial and commercial developments, as well as the physical size of cities and the building of highways and public works. Shifting proportions of old and young will influence fields of occupation and facilities for education, culture, and recreation. Thorough investigation of population conditions and movements is essential to sound planning.



RELATIVE GROWTH OF THE NEW ENGLAND STATES

ESTIMATE OF FUTURE POPULATION MADE BY THOMPSON & WHELPTON - 1934
FIGURES FOR 1790 TO 1930 TAKEN FROM U S CENSUS

FIGURE 6

Population Distribution and Growth

Comparison of New England With Other Divisions.—To estimate the future growth of New England requires study of its past growth and of the relation of that growth to that of the United States as a whole and of other geographical regions.

The United States has steadily increased in population, but it is evident that the rate of increase is diminishing (fig. 24). A study of the growth of the United States from 1790 to 1930 shows that the New England rate of growth has been less than that of the entire country. The Middle Atlantic group and the United States as a whole grew at a similar rate. The rate in New England has about paralleled that in the South Atlantic Division (fig. 8).

Considering growth in the New England group (fig. 6), there is evident a similarity among industrial Massachusetts, Connecticut, and Rhode Island, and an equal similarity among Maine, New Hampshire, and Vermont.

Density of Population.—New England in 1930 had a density of 131.8 persons per square mile compared with 90.2 in 1900. A comparison of State densities shows a high concentration in the south.

POPULATION DENSITIES PERSONS PER SQUARE MILE - 1900 - 1930

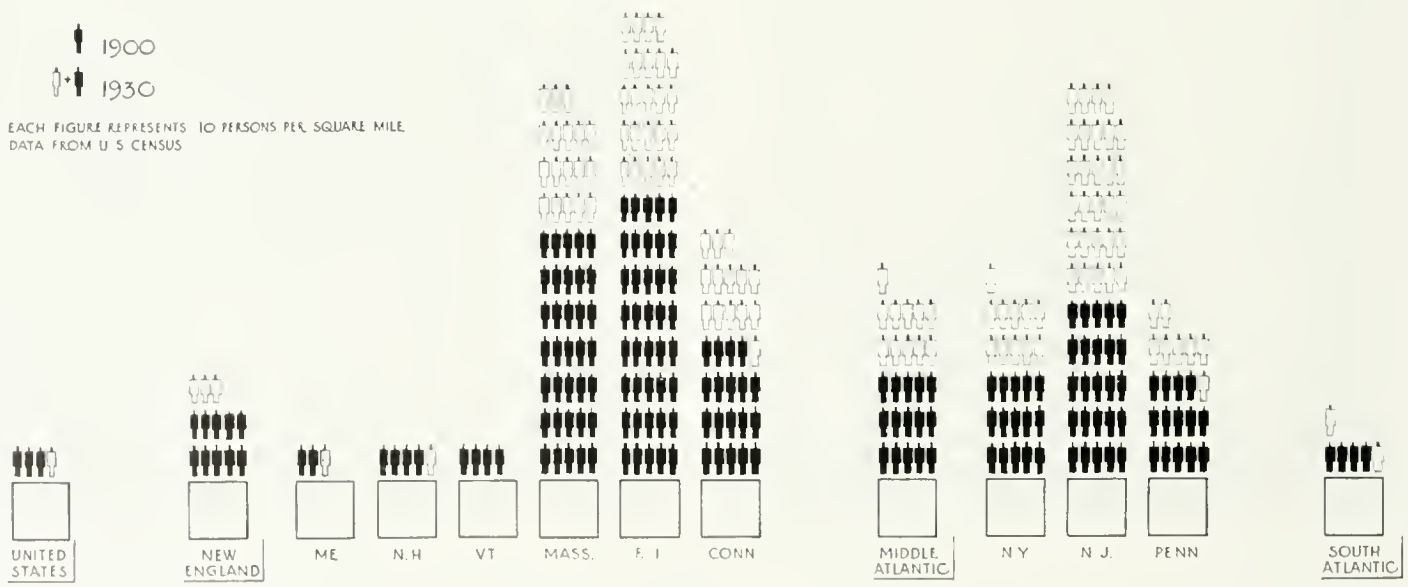


FIGURE 7

	Number of people per square mile, 1930
Rhode Island	644.3
Massachusetts	528.6
Connecticut	333.4
New Hampshire	51.5
Vermont	39.4
Maine	26.7

The variations of population density in New England in 1930 are indicated in fig. 3. The changes in county densities from 1900 to 1930 are shown in fig. 9. The continuing concentration in the southern section is marked.

New England is one of the most densely populated regions in the country. Rhode Island (644.3 per square mile) has the highest density of any State, with New Jersey (537.8 per square mile) standing second. Massachusetts follows with a density slightly less than that of New Jersey. Figure 7 shows the comparison of New England with other parts of the country.

Urban-Rural Distribution.—Seventy-seven percent of the New England population is urban. There has been a continuing drift from rural sections (fig. 10), and the proportion of rural population was reduced from 10 percent in 1880 nearly to 20 percent by 1930.

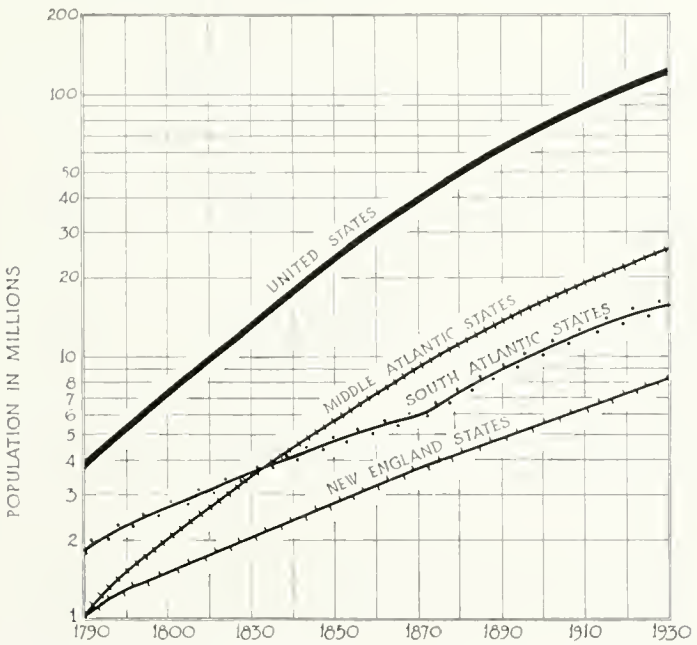
Changes in the 1930 census classification methods[1] were responsible for urban and rural figures for that year which were misleading when compared with those of previous years; in general, the 1930 urban totals are low, and the rural high. Adjusted to the 1920 basis, the 1930 percentage of population which was rural was a little lower than the 1920 percentage. The changes in rural ratios for the six States are shown in figure 10, with 1930 figures adjusted to permit comparison of periods.

Rural-Nonfarm Population.—During the past decade in New England, there has been acceleration in the growth of the rural-nonfarm population. Of the 22 percent in the rural class, 500,000 (6 percent of the total population) are in the farm class and the remainder in the nonfarm, according to 1930 figures. The nonfarm class comprises people outside of places with 2,500 inhabitants and over, not living on farms. This constitutes the New England village population.

Eighty-eight thousand of the 1,355,000 people living in villages are in 95 incorporated places of under 2,500.

Concentration Areas.—The greater part of the rural-to-urban migration has been toward the larger urban centers. Though under way since the first of the century, the movement was stronger during the last decade. Metropolitan districts are areas with 100,000 or more inhabitants and include, besides the central

[1] Urban population, by census definition, is that in cities or incorporated places having 2,500 inhabitants or more, the remainder being classed as rural. In 1930 this rule was modified for New England by placing in the urban class, besides cities, any town having a village of more than 2,500, and comprising by itself or with other villages more than 50 percent of the town population.



POPULATION TREND OF THE UNITED STATES, NEW ENGLAND AND RELATED AREAS

DATA TAKEN FROM U S CENSUS REPORTS

FIGURE 8

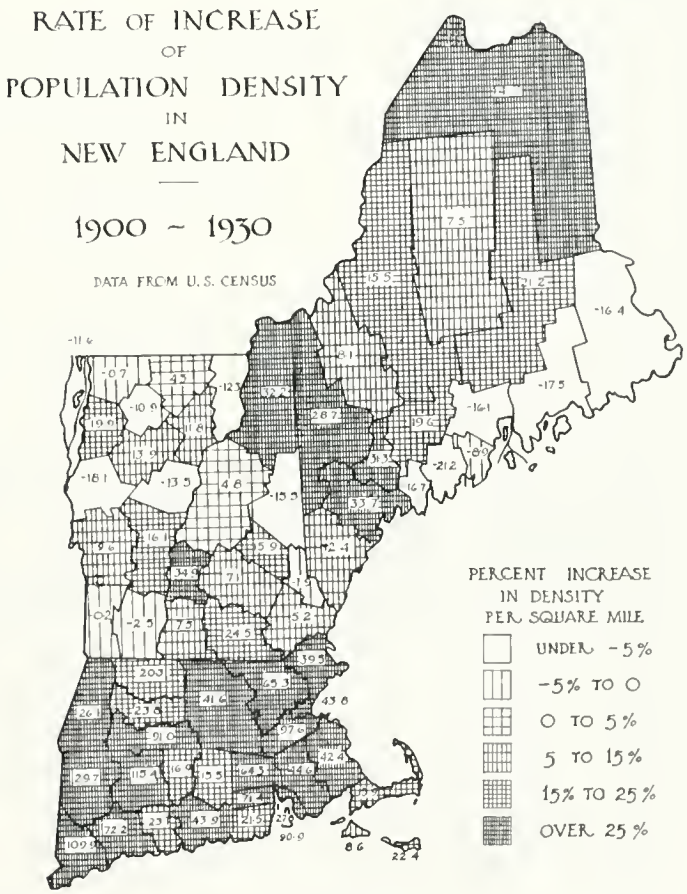


FIGURE 9

city, all adjacent civil divisions having 150 persons per square mile, and those less dense places contiguous to the central city entirely or nearly surrounded by divisions with 150 persons per square mile. Nine of the country's 96 such areas are in New England and their inhabitants comprise two-thirds of the population. In table I is listed the population of these districts, which are indicated by the concentration areas shown in figure 3.

A significant fact concerning these centers is that their rates of population increase from 1920 to 1930, are well above 5.8 percent (the rate for the rest of New England). The Boston district, for example, shows an increase of 14.9 percent, and Hartford 23.4 percent.

Suburban Areas.—Table I shows that of the total metropolitan district population, more than half live in the suburbs, which are growing faster than central cities. For example, the percentage of increase of the Boston district from 1920 to 1930 was 14.9, whereas that of the city proper was only 4.1. Another fact is that the growth rate of suburban communities within these metropolitan districts is greater than in outside suburban communities.

Many city centers in the United States have shown decreasing rates of growth since 1920, the movement being from the city proper to less dense outside sections.

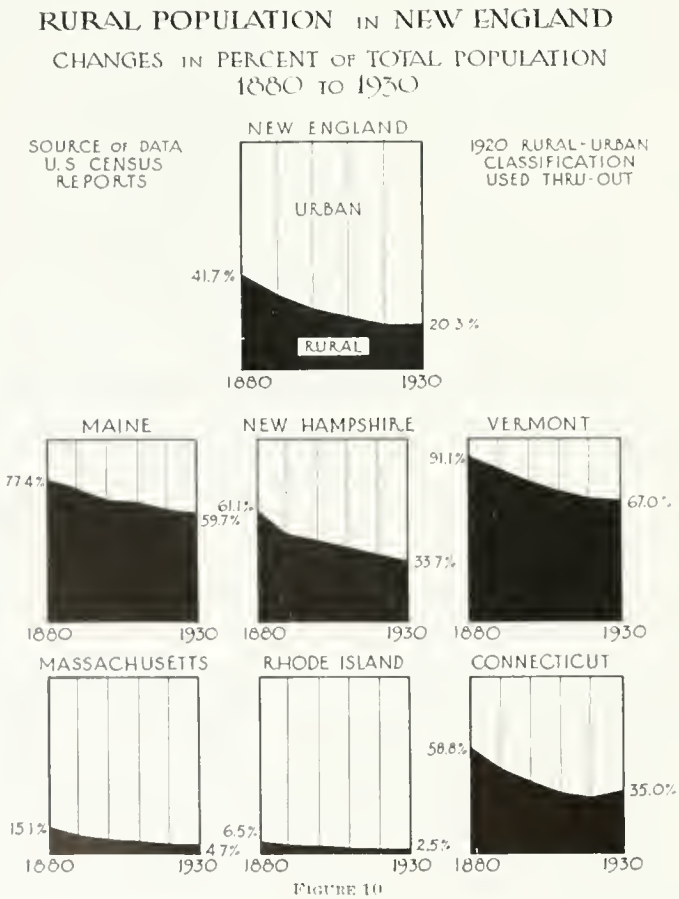


FIGURE 10

Changes in Distribution.—When there is almost no immigration, an increase in one area greater than the natural increase rate must be compensated by a decrease in some other portion of the country, usually a territory of a different class. Movement has been from the older and less dense areas toward the highly concentrated centers. This flow is from both urban and rural regions. It is pictured in figures 12 and 13.

An important question is whether decreases are occurring more rapidly in large or in small cities. "The Metropolitan Community," by R. D. McKenzie, shows that in the United States as a whole there was a greater rate of increase between 1920 and 1930 than in the previous decade, both in cities of 500,000 and over, and also in cities of 2,500 to 15,000. But cities between 15,000 and 500,000 have shown a decrease in rate of growth.

TABLE I.—*Metropolitan districts of New England, 1930*

[United States Census, 1930]

	Total population	Rate of increase 1920 to 1930	City population	Outside city population
		Percent		
Boston	2,307,897	14.9	781,188	1,526,709
Springfield-Holyoke	398,991	10.9	206,437	192,554
Lowell-Lawrence	332,028	−3.1	185,302	146,726
Worcester	305,293	10.3	195,311	109,982
Providence-Fall River-New Bedford	963,686	9.7	480,852	482,834
New Haven	293,724	13.4	162,655	131,069
Hartford	471,185	23.4	164,072	307,113
Waterbury	140,575	8.8	99,902	40,673
Bridgeport	203,969	9.9	146,716	57,253
Total	5,417,348	12.8	2,422,435	2,994,913
Percent of New England population	66.3		29.6	36.7
New England population outside Metropolitan districts	2,748,993	5.8		

In New England this tendency is not apparent; table II shows that since 1890 the percentage of the population of the entire region living in places of 2,500 to 10,000 has declined, while it has increased in larger places. Although cities of above 100,000 show the greatest growth rate, the intermediate group (10,000 to 100,000) is holding its own. Groups of places showing decline since 1900 in their proportion of inhabitants are those of under 10,000 population.

These movements are in evidence in New England:

1. Concentration in the metropolitan districts.
2. Growth of the suburbs within these districts.
3. Maintenance of ratio of population in units of between 10,000 and 100,000 to population in New England as a whole.

An example of the first movement is the growth of the Boston metropolitan district between 1920 and 1930 (14.9 percent). This increase is the result of the

second movement (suburban development), for the city of Boston itself has grown at a decreasing rate:

Gain or loss:	*Percent*
1900–10	19.6
1910–20	11.6
1920–30	4.4
1930–35	4.7

Since the metropolitan districts of New England contain 5½ million people many cities of less than 100,000 come within their boundaries.

Areas of Declining Population.—The growth of the suburban and rural-nonfarm classes of places has been compensated by losses in other parts of New England. From 1920 to 1930, of the 67 counties of the region, 13 show loss. All 13 are in Maine, New Hampshire, and Vermont, where there are no metropolitan districts, and where industrial strength is comparatively low. This trend is not limited to New England, for during the same period there were losses in 41 percent of all counties in the United States.

The proportion of the New England population living in places of less than 10,000 has decreased since 1900, the tendency being marked from 1920 to 1930 (table II). The distribution of absolute losses among different classes of towns and cities is given in table III.

Figure 12 shows the location of the 865 civil divisions, incorporated and unincorporated, which lost population between 1920 and 1930. In that period 996 divisions gained (fig. 13). Since the losses occurred mostly in the rural regions, they are evidently the sources of the flow toward industrial areas. Within the latter, however, are several cities of over 25,000 which suffered substantial losses in population due to industrial vicissitudes between 1920 and 1930. In several of the Massachusetts cities changes between 1930 and 1935 show further losses. New England cities which have lost since 1920 are shown in Table IIIa.

In Vermont, studies of declining population and contributory conditions, particularly in hill towns, provide valuable data for planning rural communities. Connecticut also has made investigations of population shifts and of the economic conditions of rural families.

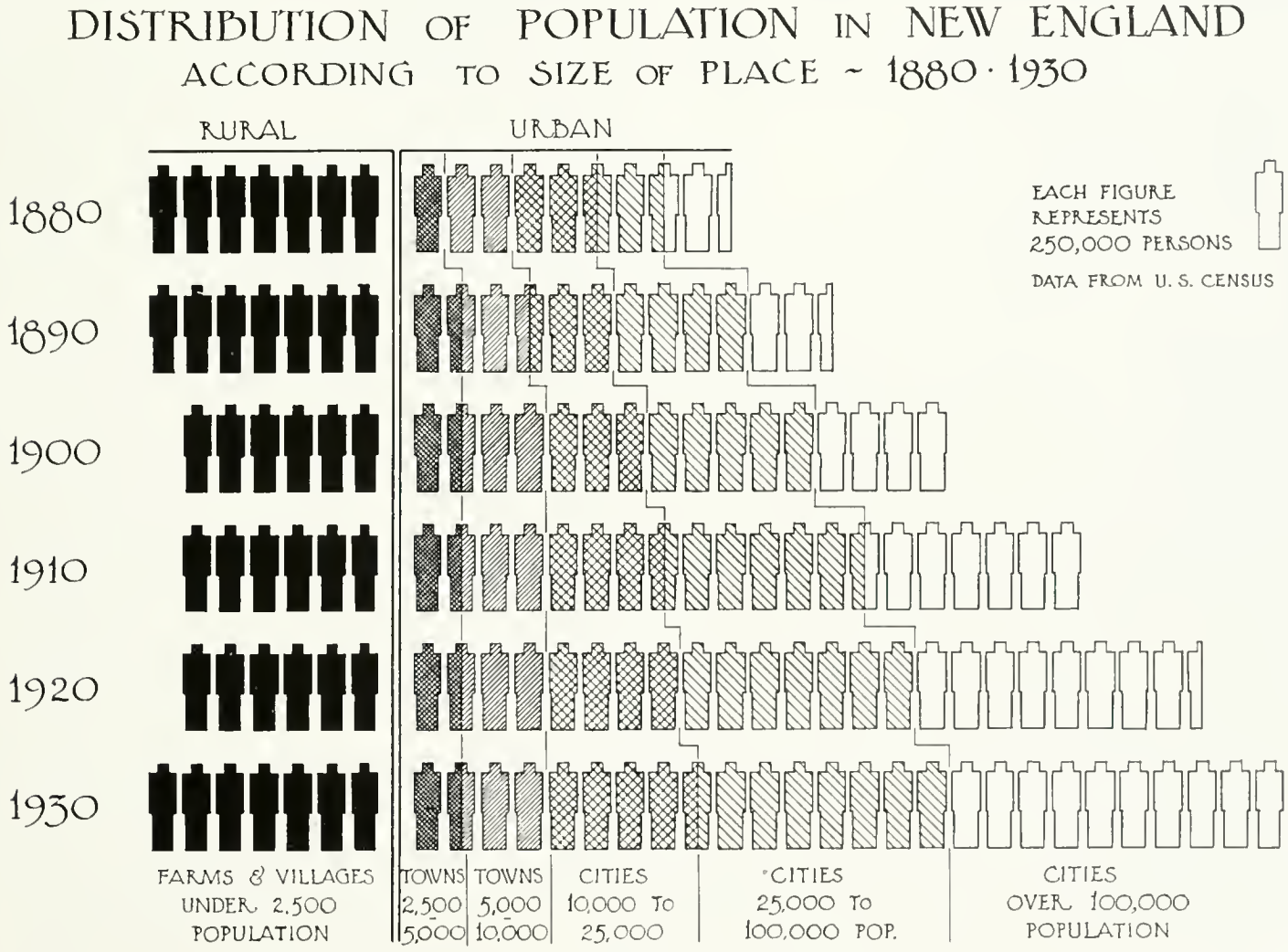


FIGURE 11

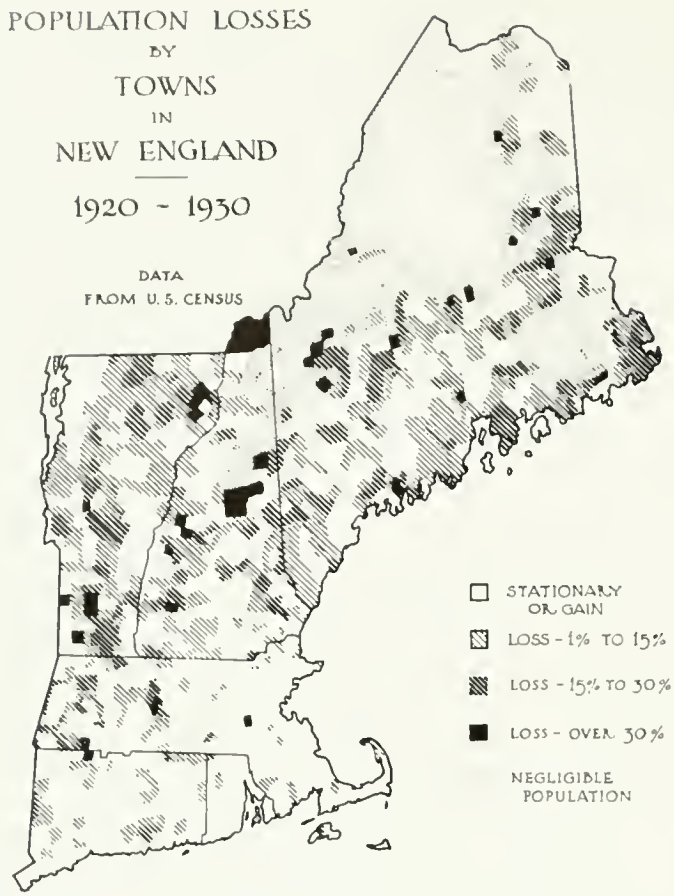


FIGURE 12

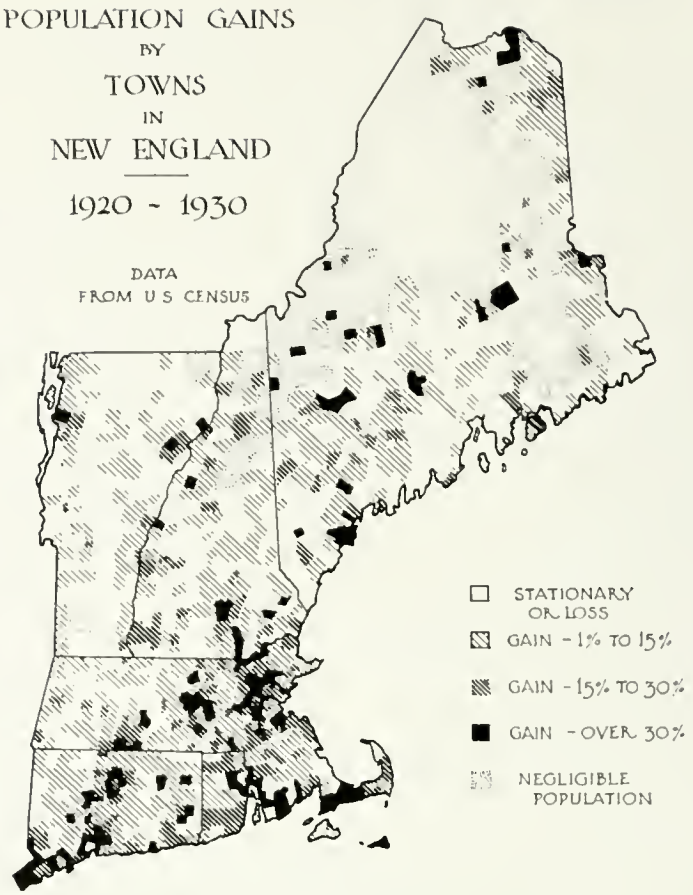


FIGURE 13

TABLE II.—*Distribution of population in New England by size of place, 1930*

[United States Census, 1930]

URBAN PLACES

Size of place	Number of places 1930	Population 1930	Percent 1930	1920	1910	1900	1890
100,000 or more	13	2,500,799	30.7	29.6	21.6	19.1	12.4
25,000 to 100,000	12	1,956,666	24.0	23.0	24.4	22.4	21.8
10,000 to 25,000	78	1,242,450	15.1	14.3	13.0	14.5	13.8
5,000 to 10,000	68	491,561	6.0	8.1	9.6	10.8	9.5
2,500 to 5,000	31	120,500	1.5	4.2	4.7	5.7	9.3
Total urban		6,311,976	77.3	79.2	76.3	72.5	66.8

RURAL TERRITORY

Nonfarm:							
Incorporated places of 1,000 to 2,500	35	60,735	0.74				
Incorporated places under 1,000	60	27,436	0.34				
Population outside incorporated places		1,267,111	15.5				
Total nonfarm		1,355,282	16.6				
Total farm		499,083	6.1				
Total rural		1,854,365	22.7	20.8	23.7	27.5	33.2
Total New England		8,166,341	100.0	100.0	100.0	100.0	100.0

TABLE III.—*Losses and gains of population by size of place, 1920–30*

	Total number of places	Net gain	Number of places gaining	Number of people gained	Number of places losing	Number of people lost
Cities over 10,000 population	132	544,920	112	599,990	20	55,070
Urban places 2,500 to 10,000 and rural townships over 2,500 population	263	203,060	222	222,110	41	19,050
95 incorporated places and 1,369 unincorporated townships under 2,500 population	1,464	18,640	662	74,420	802	55,780
Total	1,859	766,620	996	896,520	863	129,900

TABLE IIIa.—*Changes of population in New England cities*

	Change, 1920–30	Change, 1930–35
	Percent	*Percent*
Lowell	−11.1	−0.1
Lawrence	−9.8	2.0
Haverhill	−9.6	1.7
New Bedford	−7.1	−2.3
Holyoke	−6.1	−0.7
Fall River	−4.3	1.9
Brockton	−3.7	−2.2
Manchester	−2.0	

Population Composition

Native White, Foreign, and Colored Classes.—New England has a larger proportion of foreign-born inhabitants than any other region in the country. In 1930 native whites of native parentage and native whites of foreign or mixed parentage constituted, respectively, 40 percent of the total population. Foreign-born whites constituted 20 percent of the total. The proportion of foreign-born whites has doubled since 1850, increasing from 11.2 to 22.6 percent (table IV). During this period the foreign-born white component of the United States population increased from 9.7 to 11.6 percent. Yet in recent years a drop in foreign immigration has lowered the foreign-born ratio. The decrease in immigration has been somewhat offset by the diminishing increase in native stock.

TABLE IV.—*Native and foreign population of New England, 1930*

[United States census, 1930]

	Percent of total			
	1930	1920	1910	1900
Native white of native parentage	38.8	37.9	39.9	44.9
Native white, foreign or mixed parentage	37.5	35.7	31.3	28.2
Foreign-born white	22.5	25.3	27.7	25.7
Negro	1.2	1.1	1.0	1.0
Other races	.1	.1	.1	.1

These figures indicate future increase in the proportion of native born of native parents if immigration restriction continues, and a percentage of foreign born and native born of foreign parents which will diminish to a negligible point, implying amalgamation of existing stocks and stabilization of racial strains. But the resulting "native born of native parents" population will not be of the same type as the older native stock of English origin, which now constitutes most of the "native born of native parents" group.

Proportion of Old and Young.—Comparison of age groups shows that New England has a larger percentage of its total population in the higher age groups than has the country as a whole (table V). Figure 14 shows the relative size of the age groups from 1880 to 1930, with estimates for 1960 based on factors to be discussed later.

TABLE V.—*Age groups in New England and United States, 1930 and 1920*

[United States Census]

Age	New England (percent of total)		United States (percent of total)	
	1930	1920	1930	1920
Under 5	8.4	10.2	9.3	10.9
5 to 19	27.6	26.4	29.5	29.8
20 to 44	37.4	38.9	38.3	38.4
45 to 64	19.9	18.8	17.5	16.2
65 and over	6.7	5.7	5.4	4.7
Proportion under 45	73.4	75.5	77.1	79.1
Proportion 45 and over	26.6	24.5	22.9	20.9
Total	100.0	100.0	100.0	100.0

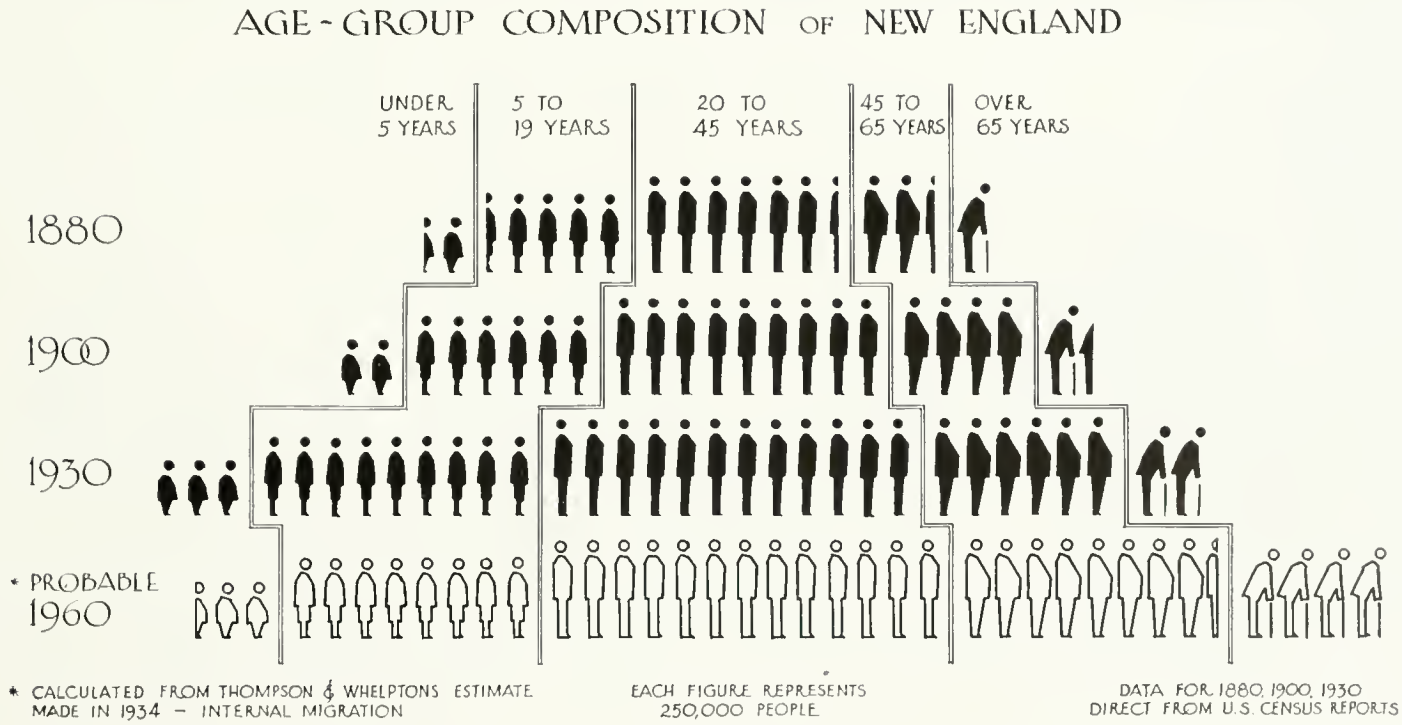

AGE-GROUP COMPOSITION OF NEW ENGLAND
UNDER 5 YEARS
5 TO 19 YEARS
20 TO 45 YEARS
45 TO 65 YEARS
OVER 65 YEARS
1880
1900
1930
* PROBABLE 1960
* CALCULATED FROM THOMPSON & WHELPTONS ESTIMATE MADE IN 1934 – INTERNAL MIGRATION
EACH FIGURE REPRESENTS 250,000 PEOPLE
DATA FOR 1880, 1900, 1930 DIRECT FROM U.S. CENSUS REPORTS

FIGURE 14

C. E. Artman's report to the United States Department of Commerce, "Industrial Structure of New England", indicates that the proportion of the higher age group is not materially greater in the urban classification in New England than it is in the United States, yet it is appreciably greater in the rural.

The population pyramids in figure 15 show variation in the age-group composition of the three classes: native white of native parentage, native white of foreign parentage, and foreign-born white. This difference indicates higher rates both of births and of deaths among those of foreign extraction, though it may be partially accounted for by changes in volume of immigration. Changes between 1910 and 1930 show these characteristics:

Foreign-born whites: No replacement by younger immigrants of losses through death in older age groups.

Native whites of foreign parentage: Increase in the higher age groups lagging a generation behind increase in foreign born of same groups; decrease in the younger groups due to decrease of foreign born in the fertile-age groups.

Native whites of native parentage: No change in age composition except an increase in younger groups, due to an increase in the fertile-age groups of native whites of foreign parentage.

These diagrams indicate coming changes in the composition of population.

Proportion of Sexes.—The male-female ratio is slightly lower in New England than in the Middle Atlantic Division and in the Nation as a whole. Heavy male immigration between 1900 and 1910 affected the 1910 ratios for the areas compared in table VI; from 1910 to 1930 the ratios declined.

TABLE VI.—*Males per 100 females—white population*

(United States Census, 1930)

	1930	1920	1910	1900
New England	97.2	98.5	99.2	97.6
Middle Atlantic	100.9	101.4	103.4	100.8
United States	102.7	104.4	106.0	104.4

Women outnumber men in urban areas, whereas the opposite condition prevails in rural districts. This relation is true of New England and of the United States as a whole, as table VII shows. Such a condition seems to be a result of the greater economic opportunities for women in the cities.

TABLE VII.—*Urban-rural sex ratios, 1930*

[United States Census, 1930]

	Males per 100 females	
	New England	United States
Urban	95.0	98.1
Rural-nonfarm	101.3	105.0
Rural-farm	115.5	111.0

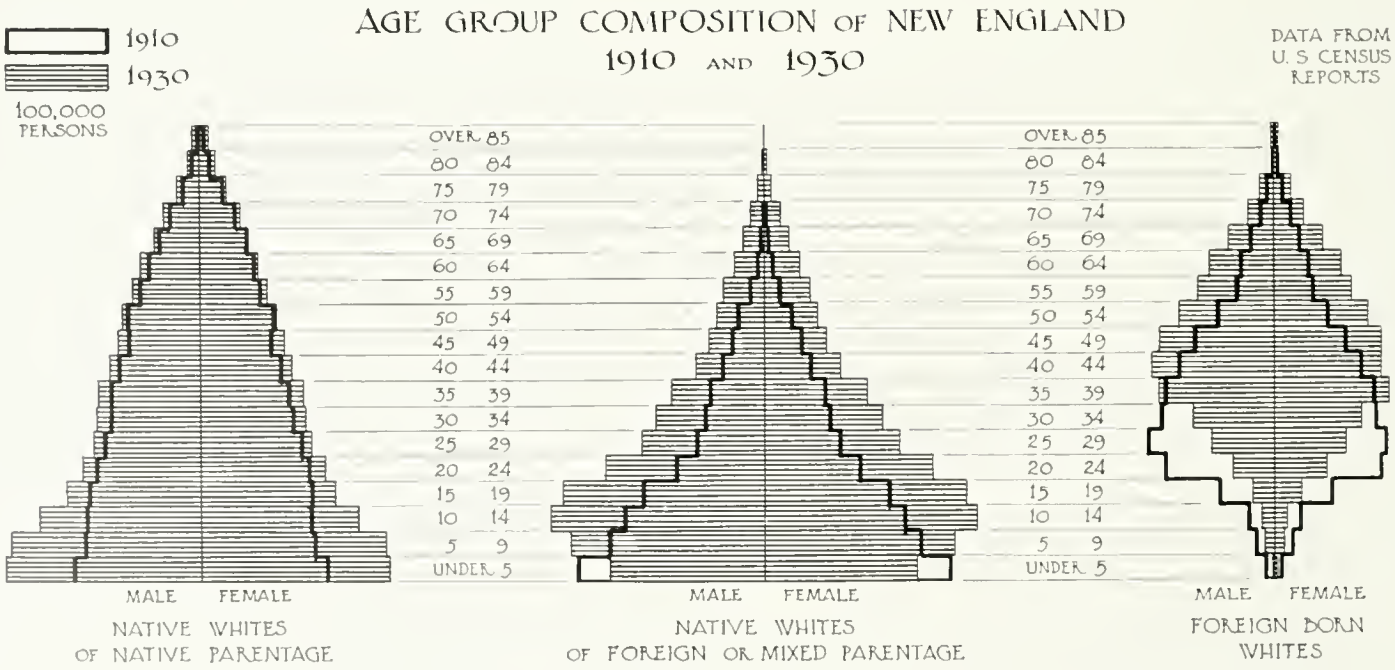


FIGURE 15

Occupations

Classes of occupations.—The population of New England is about 77 percent urban, with 17 percent in the rural-nonfarm and only 6 percent in the rural-farm class. This points to a predominance of manufacturing and mechanical industries, commercial pursuits, and activities linked with city life.

Figure 16 shows the three main classes of occupations in New England in 1910, 1920, and 1930, compared with those in certain other regions of the United States. It brings out a decline in the proportion of people engaged in agriculture. This is typical of the whole country. There is also a drop in the percentage of workers in manufacturing in New England and in the Middle Atlantic States. This contrasts with the tendency in the South Atlantic and the East North Central sections, showing the movement of industrial growth characteristic of this century.

The same trend appears in figure 17, which gives the number engaged in major groups of occupations in New England from 1890 to 1930. The number employed in agriculture decreased less than the proportion so employed. In the manufacturing and mechanical industries the number increased up to 1920, but by 1930 there was a decrease, not only relatively but also absolutely. This decline was compensated by an increase in workers in transportation, in trade, and in clerical, public, and professional services; so the percentage of the total population which is employed remains substantially the same.

This shift from productive occupations to those related to distribution is characteristic of metropolitan civilization, and is revealed in the statistics of the Middle Atlantic States, which are dominated by the New York metropolis, as well as in those of New England.

Figure 18 shows changes in broad occupational classes in New England. The decrease in industrial workers since 1920 has been less in Maine, New Hampshire, and Vermont, where industrial development is relatively recent and the population principally rural, than in the southern states, which contain metropolitan districts, and which are affected by transportation and commerce developed to a high degree. The northern states show a definite decline in agriculture.

Population and Industrial Wage Jobs.—The relation between total population and industrial wage jobs, shown in figures 19 and 20, brings out the above-mentioned tendency: in New England and the Middle Atlantic States the number of wage jobs is growing more slowly than is the population, while the opposite is true in the South Atlantic and East North Central sections.

Yet New England keeps a higher percentage of population gainfully employed than do other parts of the country (table VIII); furthermore, the number of manufacturing jobs per thousand people continues to be much greater (fig. 19). This higher rate of employment, which may be due in part to the age pattern, seems to be largely a result of the variety of industries in New England and its great number of small plants. Nearly two-thirds of the 310 national manufactures are represented in New England. The

TABLE VIII.—*Percent of total population gainfully employed*

[United States Census]

	1910	1920	1930
United States	41.5	39.4	39.8
New England	44.5	43.7	42.0
Middle Atlantic States	42.5	41.5	41.7
South Atlantic States	42.5	38.2	38.3
East North Central States	39.8	39.7	40.0

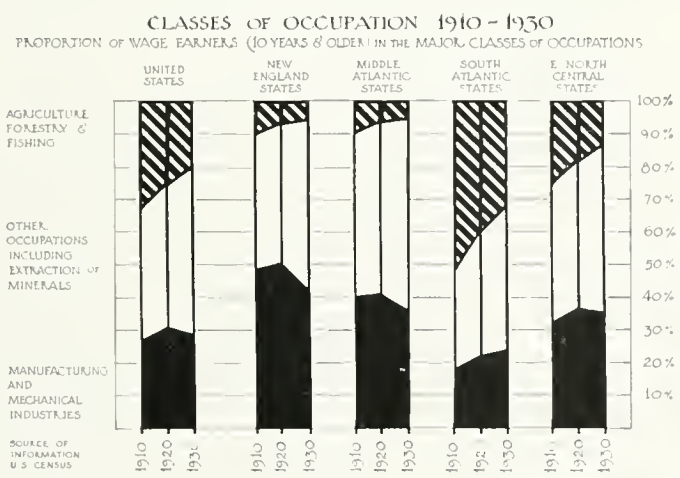


FIGURE 16

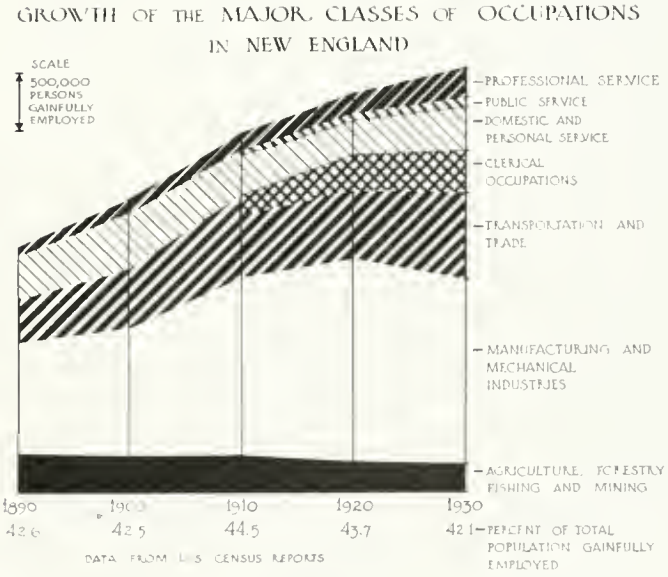


FIGURE 17

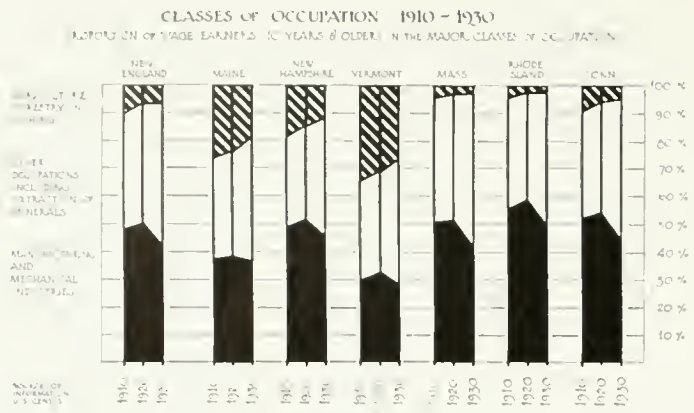


FIGURE 18

significance of small plants is indicated by the fact that, in 1929, 65 percent of the New England manufacturers employed 20 workers or less.

Areas of industrial and population concentration.—To show the extent of industrial and population concentration, the United States has been divided by the Census Bureau into three classes of areas:

1. *Primary areas.*—Comprising 93 cities of 100,000 population or more.

2. *Secondary areas.*—Comprising the remainder of the counties containing the 93 cities, together with 47 others classed as industrial areas.

3. *All other areas.*—The remaining territory.

The New England and United States distribution of population and wage jobs in these classes is shown in table IX.

The percentage of population and the relatively high percentage of wage jobs in the secondary areas show the prevalence of small-town manufacturing in New England. These secondary areas fringe large centers, and the towns that form them are satellites, not industrially independent. The percentage of population in these areas increased from 1899 to 1929. From 1899 to 1919 wage jobs increased faster than did population in all three areas in New England, but from 1919 to 1929 there was an absolute decrease of jobs in spite of continued increase in population.

In 1899 both population and wage jobs in New England were divided about equally among the three types of areas; secondary area percentages were higher than in the United States as a whole, in 1929 as well as in 1899. The ratios of industrial wage jobs per thousand population, as given in table X, indicate this continued higher degree of industrialization in New England.

There is a trend throughout the country toward industrial concentration in the secondary areas. Between 1899 and 1929 changes were not so marked in

TABLE IX. *Percent distribution of population and industrial wage jobs*

[United States Census, Location of Manufactures, 1899–1929]

POPULATION

	United States		New England	
	1899	1929	1899	1929
	Percent	*Percent*	*Percent*	*Percent*
Primary areas	22.4	29.6	29.7	30.6
Secondary areas	10.7	14.5	31.8	38.1
All other areas	66.8	55.9	38.5	31.2
Total	100.0	100.0	100.0	100.0

WAGE JOBS

	United States		New England	
	1899	1929	1899	1929
	Percent	*Percent*	*Percent*	*Percent*
Primary areas	44.6	43.8	32.1	34.3
Secondary areas	18.4	21.1	36.9	39.4
All other areas	36.9	35.1	31.0	26.3
Total	100.0	100.0	100.0	100.0

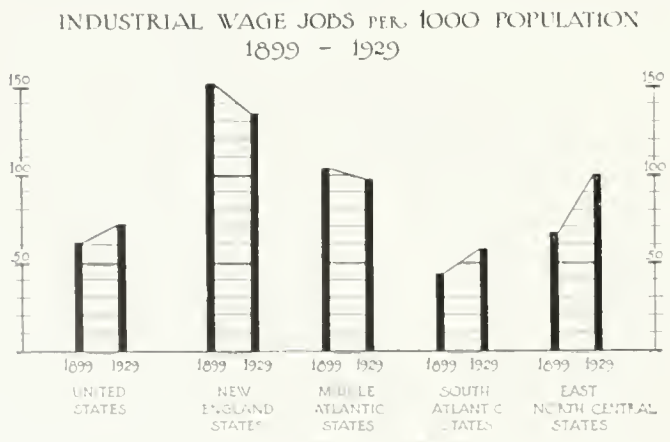


FIGURE 19

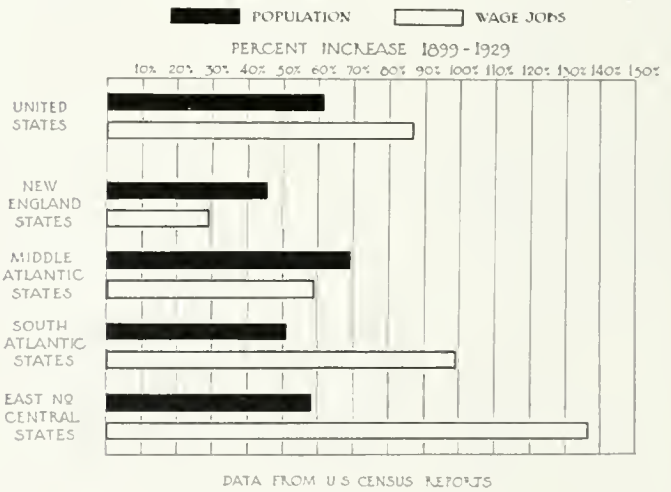

GROWTH OF POPULATION AND INDUSTRIAL WAGE JOBS
POPULATION
WAGE JOBS
PERCENT INCREASE 1899 - 1929
10% 20% 30% 40% 50% 60% 70% 80% 90% 100% 110% 120% 130% 140% 150%
UNITED STATES
NEW ENGLAND STATES
MIDDLE ATLANTIC STATES
SOUTH ATLANTIC STATES
EAST NO CENTRAL STATES
DATA FROM U S CENSUS REPORTS

FIGURE 20

TABLE X.—*Industrial wage jobs per 1,000 population*

[United States Census, Location of Manufactures, 1899–1929]

	United States		New England	
	1899	1929	1899	1929
Primary areas	124	106	165	151
Secondary areas	106	105	177	139
All other areas	34	45	123	113

New England, but the importance of secondary areas increased and will probably continue to do so.

Occupations Connected with Recreation.—The field of recreation is an important phase of New England economic life. In some sections, supplying the needs of visitors forms the principal commercial activity.

The economic value of this phase is indicated by the following data secured by the New England Council, as of 1930:

Number of summer visitors in New England in a 100-day period	3,000,000
Spent by visitors and New England population for recreation yearly	$400,000,000
Assessed valuation of property used solely for recreation purposes	$480,000,000
Taxes paid on recreational property	$13,000,000
Estimated economic worth of natural resources and historic attractions for recreation only	$8,333,000,000

The relative importance of property used for the above purposes is indicated by the valuation of such parts as are taxable: in Massachusetts and Connecticut these represent 3 percent and 2 percent respectively of the total taxable property of the State; in New Hampshire 16 percent, and in Vermont 11 percent. With the decline of manufacturing and agriculture in many towns, providing recreational services has raised valuations and employment higher than they were in the days of industrial activity. The effect of the transient population on communities is beneficial. In many rural regions, there has been a decided rise in the level of living and social conditions.

Part-time Occupations.—Part-time farming as a means of livelihood, combining agriculture with industry, is of more importance in New England than elsewhere. It was a feature of the early rural communities, and in 1930 more of the farms in New England were part-time than in other parts of the country.

Part-time farmers are of two types: farmers taking industrial jobs during slack seasons, and industrial workers farming in spare hours. Improved roads and automobiles have contributed to the increase of numbers in the second class, which is largely made up of city workers living in the country.

D. Rozman ("Part-time Farming in Massachusetts": 1930) reports an increase in farms of this type in Massachusetts between 1920 and 1930. At the date of his writing, there were in that State at least 60,000 farming enterprises on a part-time basis. A more recent study ("Part-time Farming in Connecticut": 1935), by I. G. Davis and L. A. Salter, Jr., announces that part-time farming is also widely practiced in Connecticut.

Rising cost of food distribution and increased economic insecurity have led many city wage earners into part-time farming. Roads and automobiles have facilitated decentralization of commuting workers without decentralization of industry. Radio and movie have diminished differences between country and city life. If quick communications and distribution of cheap power hasten industrial decentralization, part-time farming will have an added impetus.

Population Growth Factors

Birth and Death Rates.—From 1920 to 1934 the birth rate in New England fell from 23.6 per thousand to 15.1. Deaths per thousand dropped from 14.2 to 11.7.

In table XI is a comparison of natural increase in New England with that in the United States from 1920 to 1934. Birth and death rates are also listed in the table. The birth rates in New England and in the whole country declined, with the New England rate running from 2 percent to 6 percent lower than the United States rate until 1931, when the difference became marked, the New England rate being 7.8 percent lower than that of the country as a whole.

The New England death rate is a little higher than that of the United States; both rates show a slight downward trend.

The resulting net increase shows a drop for New England and for the entire country; the New England rate falls from 9.4 per thousand in 1920 to 3.4 in 1934; that of the United States from 10.7 to 6.1 in the same period. The reason for these rate changes and their significance will be discussed presently.

The decline in birth rate is common to the entire country and is of long duration. It started about the beginning of the nineteenth century in southern New England, where urban life and industry were developing.[2] The decline may be measured by the decrease in the number of children under 5 years per thousand women 16 to 44 years of age. Figure 21 shows this ratio for the United States from 1810 to 1930, and a predicted ratio for 1934. The drop in the number of children per thousand women from 976 in 1810 to 407 in 1930 provides a background for the downward trend that is shown in recent birth-rate figures. For New

[2] Introduction to Vital Statistics of United States, 1933; United States Census. The Outlook for Rural Youth, by O. E. Baker; U. S. Department of Agriculture.

TABLE XI.—*Births and deaths per 1,000 population New England and United States 1920–34*

Year	Births		Deaths		Net natural increase	
	New England	United States	New England	United States	New England	United States
1920	23.6	23.7	14.2	13.0	9.4	10.7
1921	23.5	24.2	12.5	11.6	11.0	12.6
1922	22.1	22.3	13.1	11.7	9.0	10.6
1923	21.9	22.2	13.3	12.2	8.6	10.0
1924	22.4	22.4	12.5	11.7	9.9	10.7
1925	21.0	21.5	12.8	11.8	8.2	9.7
1926	20.1	20.7	13.0	12.3	7.1	8.4
1927	19.7	20.6	12.1	11.4	7.6	9.2
1928	18.9	19.8	12.4	12.1	6.5	7.7
1929	17.8	18.9	12.6	11.9	5.2	7.0
1930	17.7	18.9	11.8	11.3	5.9	7.6
1931	16.6	18.0	11.5	11.1	5.1	6.9
1932	16.0	17.3	11.6	10.9	4.4	6.4
1933	15.0	16.6	11.8	10.7	3.2	5.9
1934	15.1	17.1	11.7	11.0	3.4	6.1

TABLE XII.—*Children under 5 years of age per thousand wives 15 to 44 years—1900–30*

Division and State	Ratio of children		Decrease, 1900–30
	1900	1930	
United States	929	642	286
New England	776	654	122
Middle Atlantic	823	585	238
East North Central	831	587	244
West North Central	950	652	298
South Atlantic	1,118	758	360
East South Central	1,097	771	326
West South Central	1,122	691	431
Mountain	899	721	178
Pacific	732	479	253
New England States:			
Maine	739	734	5
New Hampshire	721	678	43
Vermont	735	733	2
Massachusetts	791	647	144
Rhode Island	798	671	127
Connecticut	787	605	182

England the estimated ratio of children to women in this classification for 1930 is 375.

If the marriage rate had been falling, this might serve to account for the change in ratio, yet records indicate that this rate has not decreased during the last 60 years, but has merely fluctuated between 26 and 32 marriages per thousand of unmarried people 15 years of age and over.

Size of Family.—Another aspect of the falling birth rate appears in the ratio of children under 5 years of age to wives 15 to 44. In table XII ratios are given for the United States as a whole; for each grand division; and for each New England State. Although the New England ratio was below that of the United States in 1900, it was above in 1930; for the period 1900–30 the drop of the New England ratio was less than half the drop of the United States ratio. In 1900 the New England rate was the lowest of all division rates except that of the Pacific, while in 1930 the Middle Atlantic and East North Central rates, in addition to the Pacific, were lower. All showed a greater drop than did the New England rate from 1900 to 1930. In New England the greatest decline occurred in the highly industrialized States; Maine and Vermont maintained practically the 1900 rates.

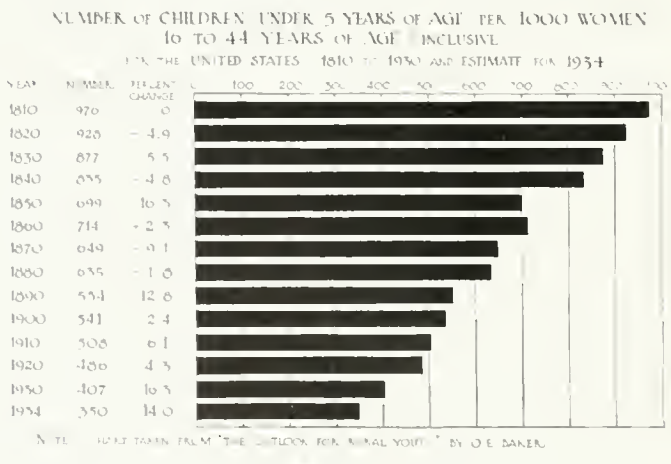

NUMBER OF CHILDREN UNDER 5 YEARS OF AGE PER 1000 WOMEN
15 TO 44 YEARS OF AGE INCLUSIVE
FOR THE UNITED STATES 1810 TO 1930 AND ESTIMATE FOR 1934
YEAR
NUMBER
PERCENT CHANGE
1810 970 0
1820 926 − 4.9
1830 877 − 5.5
1840 835 − 4.8
1850 699 − 16.3
1860 714 + 2.3
1870 649 − 9.1
1880 635 − 1.6
1890 554 − 12.8
1900 541 − 2.4
1910 508 − 6.1
1920 486 − 4.3
1930 407 − 16.3
1934 350 − 14.0
NOTE TABLE TAKEN FROM "THE OUTLOOK FOR RURAL YOUTH" BY O. E. BAKER.

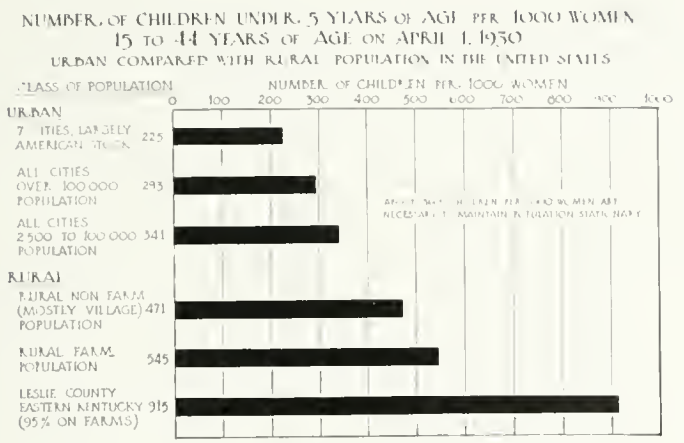
FIGURE 21

These figures indicate that the average number of young children in a New England family unit is about the average for the country. The fact that the number of young children per thousand women of child-bearing age is lower for New England than for the country is due to the lower percentage of married women in this age group in New England.

Birth rate: Urban and rural.—Birth rates vary among classes of people and according to kinds of environment. Classification into urban and rural groups does not give a true picture of the rates applying to city conditions as contrasted to rural. A more nearly accurate measure is the ratio of children under 5 to women of child-bearing age, 15 to 44 years.

Using this ratio as a measure of the number of children under 5 years per family, a contrast is shown in figure 22 between conditions in urban and rural classes for the entire United States. This chart is reproduced from "Outlook for Rural Youth" by O. E. Baker, United States Department of Agriculture, and with it is quoted the author's interpretation:

> About 360 children under 5 years of age per thousand women 15 to 45 years of age (child bearing age) are required to maintain population stationary at the 1930 expectation of life in the United States of over 60 years. In 1930 the seven cities largely of American stock, represented in the top bar of the graph, lacked, therefore, about 38 percent of having enough children to maintain their population permanently without accessions from outside, and all cities of over 100,000 population had a deficit of nearly 20 percent, while the smaller cities had a deficit of about 6 percent. On the other hand, the rural nonfarm (mostly village and suburban) population had


NUMBER OF CHILDREN UNDER 5 YEARS OF AGE PER 1000 WOMEN 15 TO 44 YEARS OF AGE ON APRIL 1, 1930
URBAN COMPARED WITH RURAL POPULATION IN THE UNITED STATES
CLASS OF POPULATION
NUMBER OF CHILDREN PER 1000 WOMEN
0 100 200 300 400 500 600 700 800 900 1000
URBAN
77 CITIES, LARGELY AMERICAN STOCK 225
ALL CITIES OVER 100,000 POPULATION 293
ALL CITIES 2,500 TO 100,000 POPULATION 341
RURAL
RURAL NON-FARM (MOSTLY VILLAGE) POPULATION 471
RURAL FARM POPULATION 545
LESLIE COUNTY EASTERN KENTUCKY (95% ON FARMS) 915
AVERAGE NUMBER OF CHILDREN PER 1000 WOMEN 15 TO 44 YEARS OF AGE NECESSARY TO MAINTAIN POPULATION STATIC NAVE

NOTE: CHART TAKEN FROM "THE OUTLOOK FOR RURAL YOUTH" BY O. E. BAKER

FIGURE 22

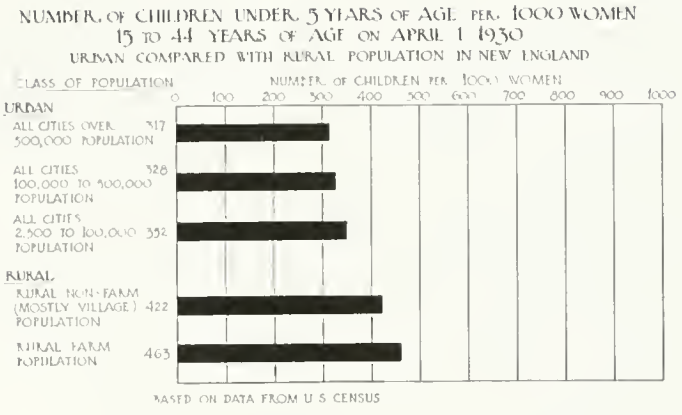

NUMBER OF CHILDREN UNDER 5 YEARS OF AGE PER 1000 WOMEN 15 TO 44 YEARS OF AGE ON APRIL 1, 1930
URBAN COMPARED WITH RURAL POPULATION IN NEW ENGLAND
CLASS OF POPULATION
NUMBER OF CHILDREN PER 1000 WOMEN
0 100 200 300 400 500 600 700 800 900 1000
URBAN
ALL CITIES OVER 500,000 POPULATION 317
ALL CITIES 100,000 TO 500,000 POPULATION 328
ALL CITIES 2,500 TO 100,000 POPULATION 352
RURAL
RURAL NON-FARM (MOSTLY VILLAGE) POPULATION 422
RURAL FARM POPULATION 463
BASED ON DATA FROM U. S. CENSUS

FIGURE 23

a surplus of 30 percent, and the farm population a surplus of 50 percent. In 1930 urban deficit and rural surplus almost balanced.

A similar analysis of New England population (fig. 23) reveals similar ratios in the relative number of children under five in different types of environment.

The less congested environment is conducive to larger families. Also, variations in the child-production factor are not limited to influence by distinction between urban and rural, but are influenced by such community conditions as size and type. The lowest birth rate is found in large cities; the highest in rural regions.

Foreign Immigration.—For the last century the population growth of New England and that of the country as a whole have been largely augmented by immigration; but New England, due to its location and industrialization, has taken in the proportionately larger number of immigrants. The percentage of foreign born rose from 11.2 in 1850 to 22.6 in 1930; for the same two periods the percentages for the United States are 9.7 and 11.6.

But these figures fail to show the extent of the change effected by immigration. From 1830 to 1930, the population of New England increased by 6,212,000. In 1930 3,970,000 people in New England were either foreign born or born of foreign parents; this is a conservative estimate of the number whose presence in New England today is due to foreign immigration within the past hundred years, but it amounts to 65 percent of the total increase for that period. Yet immigration has been diminishing. The following table shows the trend for the United States as a whole. Statistics are not available for New England, but the trend is about the same.

Between 1915 and 1920 immigration was cut by wartime legislation and conditions. A radical change of policy was initiated by the Immigration Act of 1917 and strengthened by acts in 1921 and 1924.

These restrictions, combined with the depression, brought about a negative net movement of immigrants in 1932 and 1933. Changing economic situations may slightly increase the net immigration, but the volume of future immigration and its influence on our population will probably be negligible. This applies to New England as well as to the rest of the country.

Immigration has influenced population growth not only by directly augmenting it, but as well by affecting the rate of natural increase. The immigrant class has a distinctly higher birth-rate than has the native population. The death rate is higher also, but not enough to cancel the differential. These higher rates do not continue to be characteristic in the American environment; for the birth rate drops in the first generation, and subsequently more nearly approximates that of the native stock (see Population Pyramids shown in fig. 15). Thus the high proportion of foreign born in 1900 served to bolster the dropping birth rate of urban New England. But as the percentage of foreign-born dropped and the percentage of native-born of foreign or mixed parentage increased, the total birth rate fell. As the remnant of foreign born dwindles and the first generation is replaced by suc-

TABLE XIII.—*Foreign immigration in the United States*

[United States Census]

Period	Yearly average total immigration in thousands	Yearly average net immigration in thousands	Period	Yearly average total immigration in thousands	Yearly average net immigration in thousands
1901–05	767	...	1926–30	294	224
1906–10	992	.....	1930	242	191
1911–15	892	603	1931	97	35
1916–20	255	115	1932	36	−68
1921–25	534	388	1933	23	−57

ceeding generations, it is probable that the rate of natural increase for New England will continue to diminish.

Domestic Migration.—The movement from one section to another is continuous, but in established regions the net result in numbers is a minor factor. Statistics on internal migration are not available, but the following calculation gives the net total migration into New England between 1920 and 1930:

	Increase in population	Percentage of 1920 population
Total increase	765,400	10.3
Natural increase	642,000	8.5
Net immigration	123,400	1.7

Thus 16 percent of New England's increase is attributable to migrants, whose sources are unknown. The greater proportion is undoubtedly foreign, and that part of New England's increase due to foreign immigration will, as previously indicated, diminish to a negligible point.

The part played by domestic migration into and out of New England is suggested in table XIV.

TABLE XIV.—*Migration between New England and other parts of the United States*

[United States Census 1930]

Year	Population native to United States				
	Born in New England		Living in New England		Net loss (thousands)
	Total (thousands)	Living in other divisions (percent)	Total (thousands)	Born in other divisions (percent)	
1930	6,596	12.1	6,289	7.8	−307
1920	5,660	11.0	5,489	8.2	−171
1910	4,907	11.6	4,702	7.7	−205
1900	4,338	12.1	4,120	7.5	−219
1890	3,898	14.5	3,541	5.9	−357
1880	3,643	16.1	3,217	5.0	−427
1870	3,293	17.3	2,839	4.0	−454

For many decades New England, which for 200 years exported pioneers as well as goods, has suffered a net loss of native-born population. Heavy foreign immigration during the last century more than offset this loss and accounted for the rapid growth in population. As settlement in the rest of the country approached the saturation point, the net loss of native migrants diminished from 1870 to 1920. Fewer New Englanders went elsewhere to live and more people from other parts of the United States settled here.

In 1930 the balance of departures over returns was greater than in 1920. The cause is not known; but industrial conditions in New England between those years probably made this region less attractive to other Americans and other regions more attractive to New Englanders.

The diminution in domestic and foreign immigration, plus the increase in emigration, is intensifying the effect of New England's declining birth-rate and is hastening the stabilization of population.

Seasonal Population.—As a recreational region New England attracts over 10 percent of the country's tourists. An investigation disclosed that in 1928 during a 100-day summer period about 3,000,000 people came into this area, and that 600,000 were here at one time. Moreover, over a like period in 1935, it is estimated that the total number approached 4,000,000. This does not necessarily assure an increase in the permanent population, but it is safe to assume that after becoming familiar with the advantages of New England as a place in which to live and work, many of these visitors may become permanent residents.

The Future Population of New England

With a picture of past trends in the growth and distribution of New England population as a background, it is possible to consider its future. As its growth is obviously linked to that of the entire country, this subject should be examined first. Reliable data in this field come from authorities such as Pearl and Reed of Johns Hopkins University, Dr. Dublin of the Metropolitan Life Insurance Co., the Bureau of the Census, and Thompson and Whelpton of the Scripps Foundation for Research in Population (Miami University, Ohio).

United States Trend.—Certain predictions regarding United States growth, made by Thompson and Whelpton and published in 1932, were used, in our preliminary study of New England population (1934), as a basis for our own estimate of population growth in New England. Their predictions were recent and were based on definite assumptions concerning birth rates, death rates, and foreign immigration. Since then, in a report to the National Resources Board in 1934, Thompson and Whelpton estimated again the growth of the country as a whole and in addition that of each State. The application to New England of both sets of predictions is presented below.

In studying the effect of the population factors mentioned, Thompson and Whelpton formulated conclusions based on certain assumptions. For example, their so-called medium trend was based on these hypotheses:

Decreased birth rate.
Longer life expectancy.
Medium foreign immigration.

On this basis the estimated United States population for 1960 is 149 million, increasing to stabilization at about 155 million in 1980.

Their low estimate was based on:

Decreased birth rate.
Longer life expectancy.
No foreign immigration.

With these as postulates their 1960 estimate is about 136 million, decreasing thereafter.

The predictions stated in their report of 1934 were based on the same assumptions as their low predictions. In addition they considered two alternate conditions: First, that the internal migration from country to city prevailing between 1920 and 1930 would continue and that, due to this, the 1960 population would reach 144½ million (this migration affects population growth through the lower urban birth rate as compared with the higher rural rate). Second, that there would be a cessation of this rural-to-urban flow, resulting in a greater increase in population due to the influence of the higher rural birth rate, and that the total population for 1960 would be 144 million.

Figure 24 shows (*a*) the population increase of the United States from 1790 to 1930 and (*b*) the trends predicted by Thompson and Whelpton, and by Pearl and Reed.

It is difficult to predict accurately the future population. To quote from the report of Thompson and Whelpton of 1934:

> Such calculations as these must necessarily be based on assumptions. * * * Even the present data regarding these matters are not exact, for all births and deaths are not registered in some States and no count is made of the movement of persons across State boundaries. * * * It should be emphasized that these calculations show what will happen if birth rates, death rates, and migration follow the trends assumed. It is understood that these assumptions will not correspond exactly to the course of development and that calculations for individual States are less likely to agree with actual population growth than are those for the United States as a whole. Nevertheless, the results should prove useful as an index of what to expect, and as a basis for ascertaining the effect of larger or smaller changes in birth and death rates.

The Bureau of the Census, which in 1921 predicted a population of about 150 million in 1960, increasing to 180 million in the year 2,000, has lowered its estimate to a stabilized total of about 130 million between 1940 and 1950. Constant revision of such estimates must be made in the light of changing conditions.

According to O. E. Baker's "Outlook for Rural Youth," the question of the future status of our population hinges on family size and environment. Urban conditions are responsible for the small number of children per family in cities, while rural conditions facilitate the raising of larger families. The contrast is seen in Figure 22. There is danger that if people continue to concentrate in urban areas, the resulting low birth-rate will reduce the average number of children per family below the point requisite to population increase. The movement from country to city was strong between 1920 and 1930. During the depression years of 1930, 1931, and 1932 this movement is reported by Galpin and Manny, of the Department of Agriculture, as having been reversed; for want of jobs large numbers left the cities to seek a living in the country. In 1933 the current turned back from country to city, presumably because of relief employment opportunities.

What movement the future will bring cannot be predicted. Since environment so strongly affects size of family, consideration must be given to types of communities suitable for healthy families large enough to provide replacements, if a decrease in population is to be avoided.

New England Trend.—When an attempt is made to predict the trend of New England growth, it becomes evident that the same influences of natural increase and foreign immigration which affect the entire country exist here, though modified by the factor of internal migration. The rate of natural increase is somewhat lower for New England than for the United States. The decline of this rate for New England from 9.4 per thousand in 1920 to 5.9 in 1930 and to 3.4 in 1934 coincides with the drift toward a smaller family unit. Foreign immigration can have little significance under present national policies. By contrast, domestic migration assumes importance. The number of people who are making permanent shifts of residence to New England is not great and is overbalanced by the number of people who are leaving (table XIV). The transient summer population of 4 million is of greater consequence.

The number of visitors in all seasons may be expected to increase in proportion to the development of suitable recreational facilities. As visitors see the advantages of New England as a place of residence and of industry, an increasing number may become permanent residents. But they will stay only if those interested in the development of this region take positive action to produce conditions that will attract newcomers. This applies not merely to facilities for recreation, but to cost of living, taxation, and labor conditions.

A start has been made. Recognizing that manufacturing is the back bone of New England economic life, the New England Council is encouraging the organization of communities and activities throughout this region. It proposes to aid them to study and to produce conditions favorable for the retention of existing industries and for the attraction of new ones. The

New England Regional Planning Commission is identifying itself with this program.

Forecast of New England Population.—When making our preliminary study of New England population, we used as a basis for prediction, in lieu of an authoritative estimate of future size, the medium estimate of Thompson and Whelpton for the country as a whole, shown in Fig. 24, and discussed under United States trend. The prediction, applied to New England, indicated a decreasing rate of growth beyond 1930, when the population was 8,166,000; it pointed to a rapid approach to stabilization about 1970 and indicated a stabilized total about 1980 of 10,000,000.

The report of Thompson and Whelpton to the National Resources Board in 1934 contains estimates for the individual States that predict a population for New England in 1960 of about 9,000,000. This assumes an internal migration similar to that of the 1920-30 period. Without this migration their estimate for New England as a whole is about the same, although there are variations in the estimates for the individual States. The trend of the population curve, charting these predictions (fig. 25), indicates stabilization about 1960.

The approach of New England population growth to a stabilized level is vividly demonstrated by the proportion of children under 5 to women of child-bearing age. This index for New England, derived from the 1930 Census, is 375. Using the index of 360 as the minimum for a stationary population, and considering the long-continued decline of this ratio for the country, it may be assumed that without an increase in the proportion of young children, the cessation of our growth is not far in the future.

The impossibility of foreseeing new conditions that may affect population growth makes predictions hazardous, yet it is reasonable to infer from past rates of increase, combined with the trends of the controlling factors which have been discussed, that about 1960 the New England population will reach a peak of approximately 9 million.

Conclusions

Growth.—Past rates of increase and the trends of controlling factors indicate that about 1960 New England population will reach a peak of approximately 9 million.

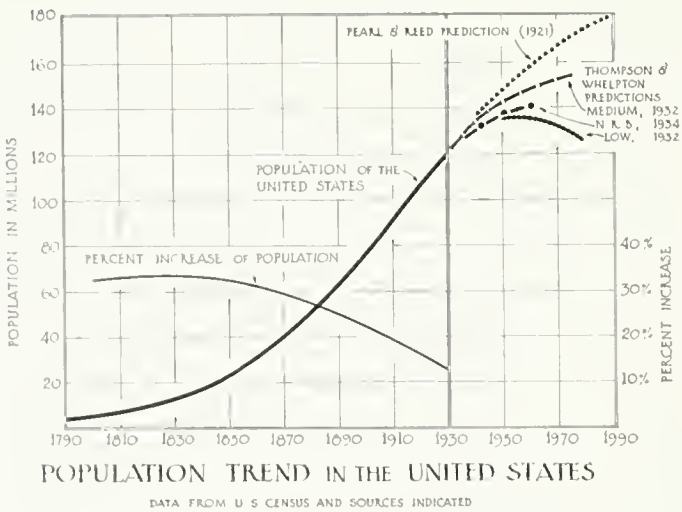
To avoid a population decrease after the peak has been reached, consideration must be given to types of communities suitable for healthy families large enough to insure replacements.

Foreign immigration has contributed more to New England's growth during the past century than to the growth of the rest of the country, due to the location and industrialization of New England. Limitation of immigration will minimize this source of increase.

Domestic migration between New England and other parts of the country has in recent years resulted in a net loss to New England.

These migration factors, combined, intensify the effect of New England's declining birth rate and hasten the stabilization of population.

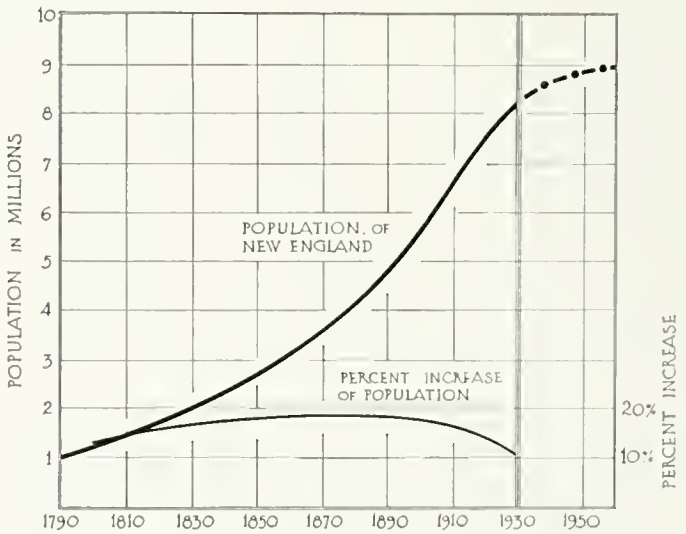
The impetus to most domestic migration is search for industrial employment. To combat the cause for emigration, the New England Council, in cooperation with the New England Regional Planning Commission, is launching a program to retain in New England existing industries and to attract new industries.



POPULATION TREND IN THE UNITED STATES

DATA FROM U. S. CENSUS AND SOURCES INDICATED

FIGURE 24



POPULATION TREND IN NEW ENGLAND

ESTIMATE OF FUTURE POPULATION BY THOMPSON & WHELPTON - 1934

FIGURES FOR 1790 TO 1930 TAKEN FROM U. S. CENSUS.

FIGURE 25

Distribution.—The following trends are apparent in the distribution of New England population:

1. Concentration in the metropolitan districts, involving continued depletion of sparsely settled areas.

2. Decentralization of population and industry within the metropolitan districts.

3. Maintenance of population level in places of 10,000 to 100,000 people.

4. Increase in rural nonfarm population.

Composition.—Cessation of foreign immigration facilitates the amalgamation of racial strains already present. Fusion of the many elements in our present population will produce a new composite type.

Extension of the urban influence by such means as the radio and automobile will effect greater similarity of living conditions and interests between city and country.

Changes in birth and death rates will result in a smaller proportion of young and a larger proportion of old people. This will require changes in planning for school systems, recreational facilities, old-age pension systems, and occupations.

Occupations.—Industrial and occupational diversification accounts for a somewhat higher rate of employment than that prevailing in other sections of the country. A smaller proportion of the population engaged in agriculture and manufacturing will probably be offset by an increase of employees in the recreational industry and in urban pursuits related to distribution rather than to production.

Further development of part-time farming, which has long been important in New England, will be influenced by the location of industries and their employment conditions.

The Place of Population Studies in Planning.—Imminent stabilization of population necessitates a radical change in our attitude toward the future. The past 30 years of New England development have been influenced by a population increase of 2½ millions; for the next 30 years the estimated increase is only 800,000. Public and private development should proceed cautiously, for the effects of mistakes will not be absorbed by expansion so quickly as in the past. The need for foresight and planning in every field is clear.

With the slowing up of population growth, communities will increase less and less rapidly, and in some cases may even decrease. Cessation of growth can bring stagnation and blight, with consequent economic and social losses to cities, especially to their crowded parts where most of the population live. To provide for sound urban development there is urgent need for intensive town and city planning.

Growth of the rural-nonfarm population suggests the need for extra-municipal planning, perhaps through county organization, to prevent mushroom growth of rural slums, as bad economically and socially as city slums.

According to present indications, it is estimated that New England in 1960 will have 100,000 less people under 20 and a million more people over 45 than in 1930. Study of the local implications of these changes in age composition is necessary to intelligent planning in many fields, particularly school systems and recreational facilities.

A study of probable future distribution of population is prerequisite to local, State, and Federal planning for all public works and services—highways, water supply, sewerage systems, parks and playgrounds. Consideration of population trends is no less important to private industries as an aid in adjustment to changing markets and labor supply conditions.

The population studies of the Commission are not yet far enough advanced to serve as a basis for a planning program. They do, however, point out tendencies largely unrecognized by those who now control development; they do demonstrate the necessity for a more thorough and detailed analysis of population factors, in order to determine how these tendencies will affect the needs which both public and private development are designed to meet. If waste in public and private enterprise is to be avoided, planning must take into account population trends.

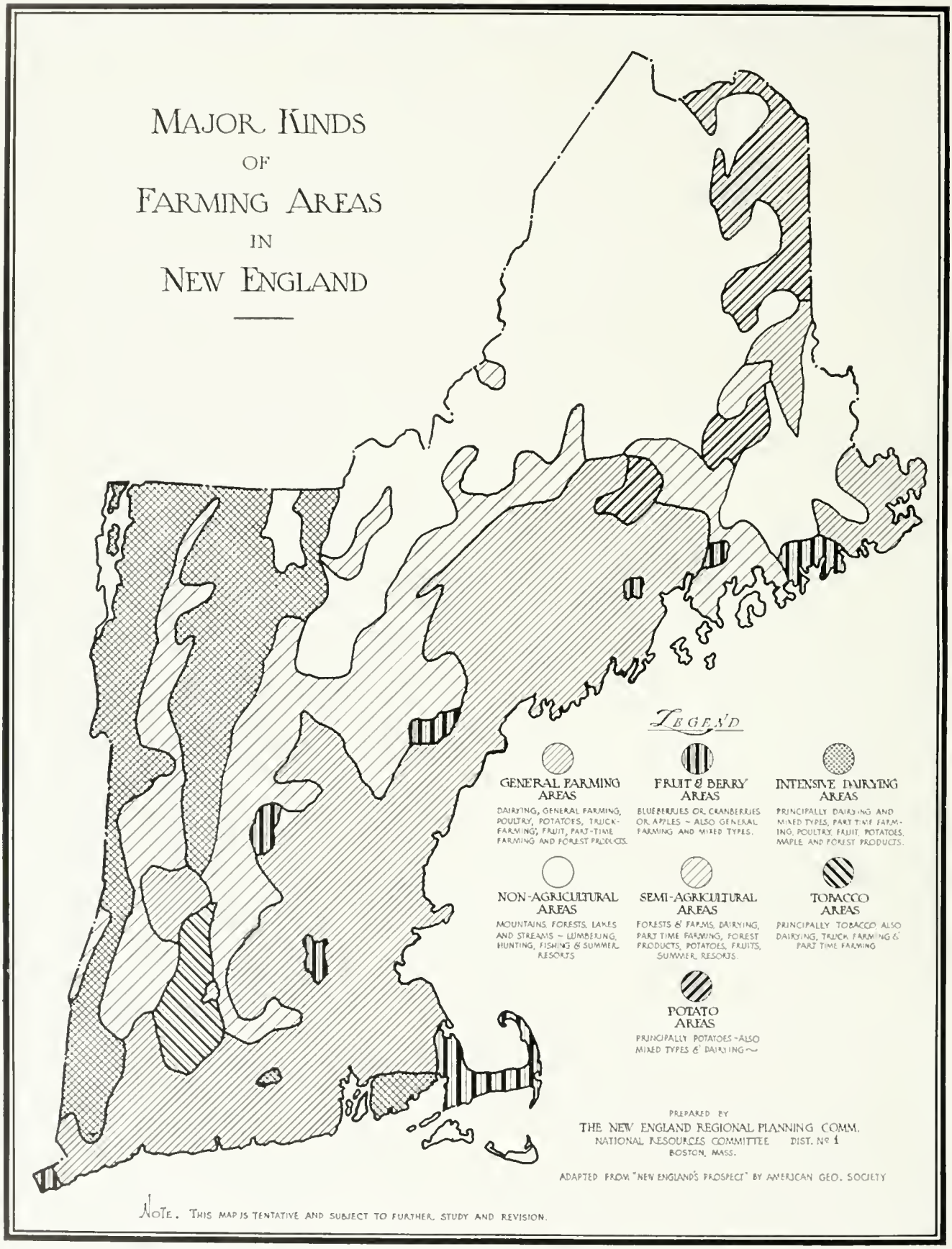

MAJOR KINDS
OF
FARMING AREAS
IN
NEW ENGLAND
LEGEND
GENERAL FARMING AREAS
DAIRYING, GENERAL FARMING, POULTRY, POTATOES, TRUCK-FARMING, FRUIT, PART-TIME FARMING AND FOREST PRODUCTS.
FRUIT & BERRY AREAS
BLUEBERRIES OR CRANBERRIES OR APPLES – ALSO GENERAL FARMING AND MIXED TYPES.
INTENSIVE DAIRYING AREAS
PRINCIPALLY DAIRYING AND MIXED TYPES, PART TIME FARMING, POULTRY, FRUIT, POTATOES, MAPLE AND FOREST PRODUCTS.
NON-AGRICULTURAL AREAS
MOUNTAINS, FORESTS, LAKES AND STREAMS – LUMBERING, HUNTING, FISHING & SUMMER RESORTS
SEMI-AGRICULTURAL AREAS
FORESTS & FARMS, DAIRYING, PART TIME FARMING, FOREST PRODUCTS, POTATOES, FRUITS, SUMMER RESORTS.
TOBACCO AREAS
PRINCIPALLY TOBACCO, ALSO DAIRYING, TRUCK FARMING & PART TIME FARMING
POTATO AREAS
PRINCIPALLY POTATOES – ALSO MIXED TYPES & DAIRYING
PREPARED BY
THE NEW ENGLAND REGIONAL PLANNING COMM.
NATIONAL RESOURCES COMMITTEE DIST. Nº 1
BOSTON, MASS.
ADAPTED FROM "NEW ENGLAND'S PROSPECT" BY AMERICAN GEO. SOCIETY
NOTE. THIS MAP IS TENTATIVE AND SUBJECT TO FURTHER STUDY AND REVISION.

FIGURE 26

STAFF REPORT—SECTION II
LAND RESOURCES

Agriculture

New England offers an interesting field study in agricultural development. Because of broken physical characteristics and wide variation of soil types, large-scale agricultural production, with a few exceptions, is impossible. Consequently, New England has developed as a region of small farms. In the early days, the food supply was necessarily close to the market because of lack of transportation facilities. Naturally, during that period the increase in farming activity coincided with the increase in population.

Later, the development of large-scale agricultural production in the Middle West, the building of the Erie Canal and the railroads, the introduction of farm machinery handicapped the New England farmer in his struggle to compete for Nation-wide markets.

Recognizing that New England could not compete with the predominantly agricultural areas in such basic commodities as wheat, corn, and livestock, the New England farmer has turned to fruits, berries, vegetables, garden truck, and dairy and poultry products, except in the few areas where natural conditions permitted the large-scale production of individual crops, such as potatoes and tobacco.

The history of New England farming has been one of continual adjustment: First, to physical conditions; later, to changing conditions in demand, competition, technique of production, and methods of transportation and marketing. The success of New England farming enterprise has varied in direct proportion to the degree of adjustment attained.

Trends

The period of maximum farming activity in New England, as indicated by farm acreage, was in 1880, when there were 24,500,000 acres in farms. Since that date, farm acreage in the United States has nearly doubled, due to utilization of the fertile and easily workable plains of the Middle West, while the farm acreage in New England has greatly decreased. In 1935 the total farm acreage had dropped to 15,463,000, of which area only about one-third was improved.

The value of New England agriculture has not decreased in proportion to the farm acreage. More intelligent and intensive use of the areas remaining in cultivation has increased the return, until today the yield per acre of vegetables and fruits is higher in New England than in any other section of the country.

Present-day Characteristics

New England agriculture of today is characterized by production of general crops, mainly for consumption in nearby population centers; and by specialized farming in certain areas where soil, rainfall and other climatic conditions are particularly favorable.

The concentration of a large population provides a local market for perishable fruits, vegetables, milk, and eggs. The perishable characteristics of such produce, however, relegate the control of New England general farming production largely to local market conditions and requirements, rather than to distant national or international markets.

Dairying is the most extensive agricultural activity in New England today. It is the chief occupation of

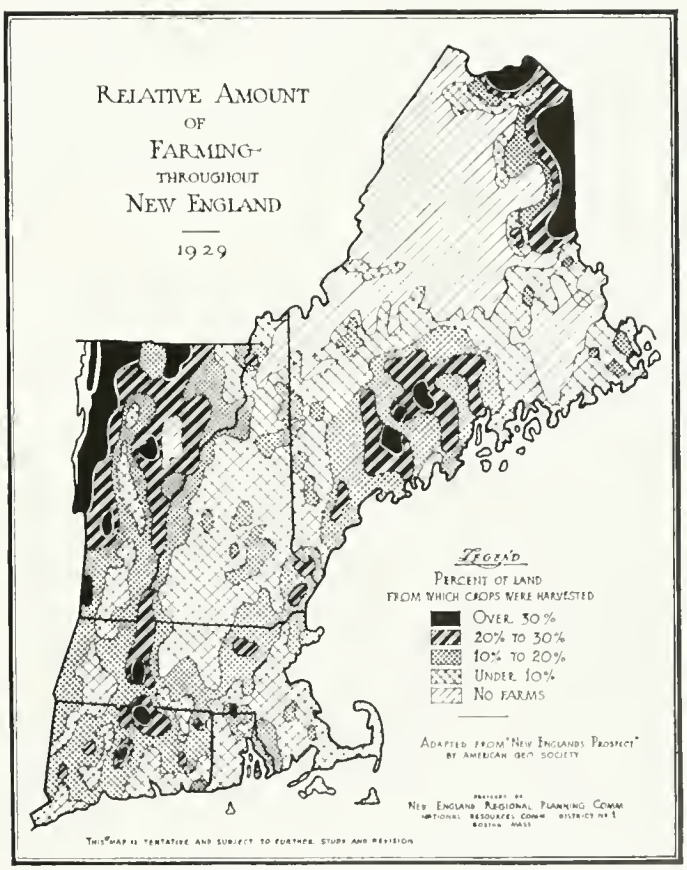


FIGURE 27

farmers in practically the entire upland area. Although dairying is often combined with other types of farming, thus making more economical use of farm labor, in some cases, due chiefly to the efficiencies of organized marketing, milk production alone has become a profitable enterprise. In many parts of the industrial lowlands, and in a few sections of the upland area, poultry raising is associated with dairying; sometimes it is the major enterprise.

Regions of specialized vegetable production are found adjacent to the large centers of population. The trend is toward extension of production areas and specialization in produce. In many places, vegetables, particularly garden-truck, are appearing as cash crops on dairy farms.

Favorable combination of soil and climate makes northeastern Main the most important potato-producing area of the country. About one-tenth of the total United States potato crop is raised in Aroostook County. Soil and climate in the lower central portion of the Connecticut Valley have combined to make this area well adapted to tobacco culture. While tobacco is not so important in total value as the potato crop, it is a vitally important factor in the economic life of the Connecticut Valley.

The Cape Cod region is exceptionally favorable for the production of cranberries, and in this region is produced nearly two-thirds of the entire United States crop. Vermont, famous for its maple syrup and sugar, produces over 40 percent of the maple output of the country.

Other agricultural specialities in New England are onions, raised in the Massachusetts portion of the Connecticut Valley; and sweet corn, in eastern and central Maine. Widely scattered, small areas, constituting an important part of the agricultural uplands, are adapted to the raising of apples, peaches, and grapes. Soils of other areas are particularly well suited to the raising of ornamental nursery stock.

Photo by courtesy of New England Council

FIGURE 28.—The variegated topography of New England and the scattered areas of arable ground have resulted in a rugged patchwork pattern of general farming.

Problems

New England, in common with the whole country, has been facing serious agricultural problems. A few of the weighty problems in this region are outlined below.

Market competition.—With the development of better transportation and refrigeration facilities, New

Courtesy of Maine Development Commission

FIGURE 29. Due to favorable soil and climatic conditions, northeastern New England leads the country in large scale potato production

Courtesy of Vermont Department of Agriculture

FIGURE 30. Fruit production is an important factor in the New England agricultural structure.

England agricultural products have been meeting serious competition from farm commodities produced in distant sections of the United States, Canada, Central and South America. This competition, first felt in grains, livestock, and wool, is now extended to include meats, fruits, fresh vegetables, and dairy products.

Marketing and merchandising.—New England agriculture is favorably located with respect to population centers and markets, and should be able to hold its own in competition with that of outside areas.

Since distant producers can sell only their best produce at prices high enough to return a profit, they have built up organizations to grade, brand, pack, ship, and market their products according to the latest and most scientific methods. On the other hand, the New England farmer, by very reason of his nearness to market, can sell his entire crop—good, bad, or indifferent—at some price. Products of high quality are suffering because little attempt is made to segregate them in the channels of trade from the lower grades.

Furthermore, New England farmers, with few exceptions, have not organized to offer their products in large volume. Consequently, many large buyers of farm produce prefer to deal with distant shippers, from whom they are more certain of getting uniform quality in a standard pack and in dependable volume.

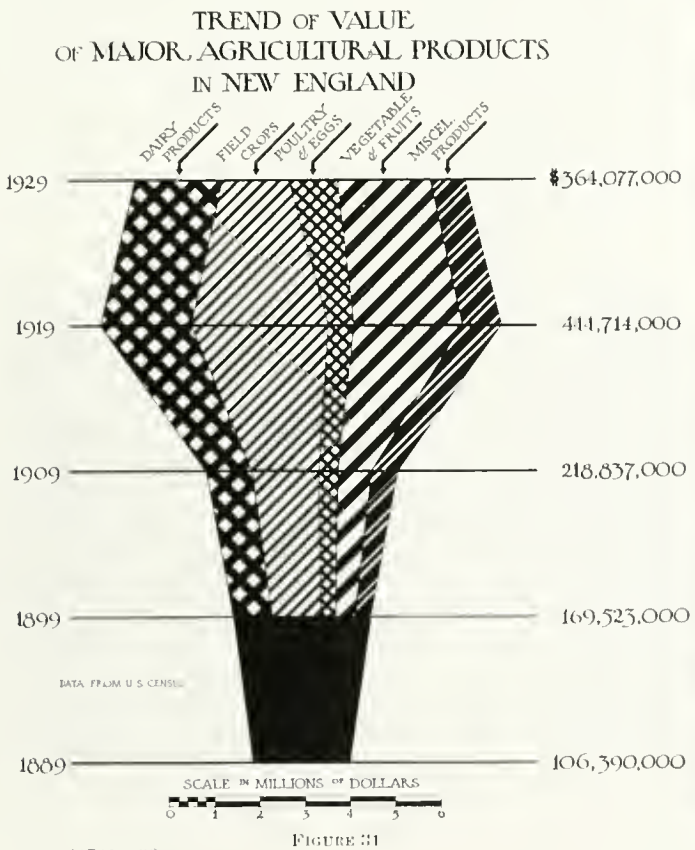


FIGURE 31

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If New England is to hold its own in markets for agricultural products, farmers must maintain uniform grading standards, and must act to a greater extent through cooperative marketing associations, rather than as individual producers.

Considerable progress has been made by the New England Council, in cooperation with the several State departments of agriculture, in developing the so-called New England marketing program. This program calls for the standardization and labeling, under a New England quality label, of standard-grade farm products. In most States, departments of agriculture have been given the necessary police power to protect the grades of products through inspection service. The success of the program depends largely on the cooperation of local producers and on the ability of State officials to make sure that products come up to the grade of the quality labels they bear.

Land Utilization.—New England, in common with other eastern areas, has unprofitable and abandoned farm lands. Whether this condition is the result of unfavorable natural endowment or of unwise farm management, these lands are economic liabilities. Yet there are often profitable uses for these lands, such as pulp, cordwood or timber production, recreation,

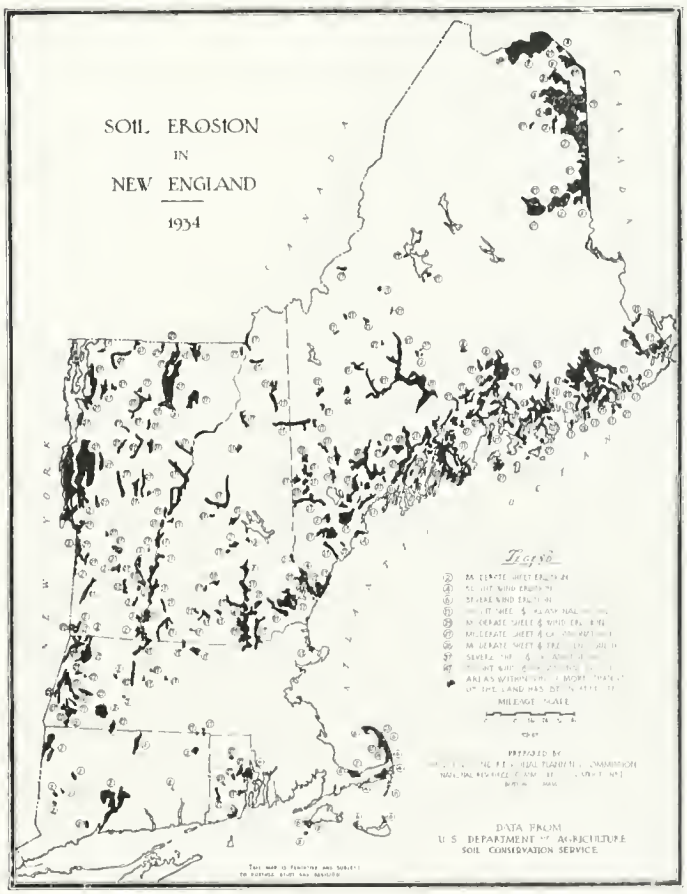


FIGURE 32

dairying, or even cultivation of certain types of crops. Intensive study of potential land uses and extension of existing education programs will do much toward eliminating the burden of unsuccessful farms in New England.

Soil Erosion.—While not yet serious, soil erosion does occur in this region. A report, with maps, prepared in 1934 by the United States Soil Conservation Service, indicates that nearly 10 percent of the land area of New England is definitely subject to a moderate degree of erosion. Unless control measures are adopted, soil erosion becomes increasingly serious. The proverbial "stitch in time" should be taken in those areas which are threatened.

Agricultural Surveys.—The United States and State departments of agriculture and the experiment stations of the land-grant colleges have been conducting scientific research in regard to agricultural problems, and have made the results available to farmers. The New England Regional Planning Commission has, to date, confined its activity in the field of agriculture to an examination of the studies and reports of these agencies. From time to time, pertinent facts have been presented graphically for use in connection with other phases of the work of the Commission.

As competition, market, and other conditions continue to change, New England agriculture must continue to adjust itself to those changes. There is need for intelligent guidance of such changes as are necessary and desirable. A detailed knowledge of New England soils and their uses is indispensable to the wisest use of the land resources of the region. Soil surveys have been made for a considerable portion, and up-to-date land-use surveys for a relatively small portion of the region. The various State and Federal agencies are advocating the early completion of these surveys.

Conclusion

New England constitutes such a large market for agricultural products that it cannot expect to meet all its own needs. Those products, such as the grains and meats, which have a relatively low value of yield per acre cannot be successfully raised in New England to any great extent. However, specialized crops which have either a high value of yield per acre in favorable areas or a direct dependence on proximity to markets can profitably be raised in large quantities on the small but fertile New England farms. To realize the possibilities of this type of farming, and to withstand the increasing competition of other regions, New England must adopt a progressive program of agricultural development.

Forestry

Study of New England forestry by the New England Regional Planning Commission is still in the preliminary fact-finding stage. Therefore, this section is limited to a presentation of the more significant facts and a general indication of the problem.

Although New England is one of the most densely populated regions of the country, a large part of it is forested. Of a total area of about 40 million acres, 27 million acres are woodland. However, less than 2 million acres of virgin timber remain, and more than half of the total forest acreage is either unproductive or productive only of low-grade cordwood.

It is estimated that the present stand of saw timber is about 58 billion board feet with, in addition, about

Courtesy Vermont Department of Agriculture

FIGURE 33.—Dairying is the most extensive agricultural activity in New England today.

Courtesy of New England Council

FIGURE 34.—"Sugaring off" in a Vermont maple grove

150 million cords of wood too small or defective to make good lumber. It is also estimated that at present New England is producing less than 50 percent of her general forest-product requirements, and only about 10 percent of her cut lumber.

Privately Owned Woodland.—The importance of privately owned forest land in New England lies not only in the operation of an active industry therein, but also in its close relation to the agricultural economic structure. On farm land, as the fertility of the soil decreases, the importance of the wood-lot increases. Of approximately 26,000,000 acres of privately owned woodland, over 6,400,000 are listed as farm woodlands. These woodlands are commercially important as a source of supply both for local wood-using industries and for the maple-products industry. New England produces annually over 40 percent of the country's maple products.

The lumber and pulp industries are centered mainly in the industrial woodlands of the three Northern States. In 1931, the production of the forest industries (lumber, paper, and wood products) was valued at over 330 million dollars, and employment averaged more than 60,000 workers. The future of the lumber and pulp industries in New England depends on the success of intelligent and far-sighted forestry programs designed to insure a sufficient supply of raw materials within their immediate vicinity. In these industries, which turn large quantities of bulky raw materials into relatively low-priced products, it is essential that transportation charges from forest to mill be kept at a minimum. In the hardwood industries, due to more intensive use of raw materials and higher value of products, nearby large tracts of timber are not so much needed.

One of the great difficulties in marketing wood-lot products at present is that the buyer has to deal with many owners of small and often widely scattered lots of timber. This is a disadvantage to buyer and seller alike. The obvious remedy is cooperative marketing; it is worth noting that there is now a hundred-thousand-dollar cooperative of 250 owners in northern New Hampshire and Vermont, the purpose of which is to pool for sale to the mills the pulpwood produced. The Northeastern Forest Experiment Station of the United States Forest Service is studying the marketing problem in New York State, and if results are successful similar studies will be made in New England.

Since it costs more to transport lumber to New England from distant sections of the country than it would cost to grow a comparable amount of good lumber on idle land here, there is a great opportunity for increasing intensive development of forestry in New England. Favorable natural conditions, excellent transportation facilities, and ready markets afforded by nearby population centers, combine to make this region admirably suited to profitable timber production under scientific management.

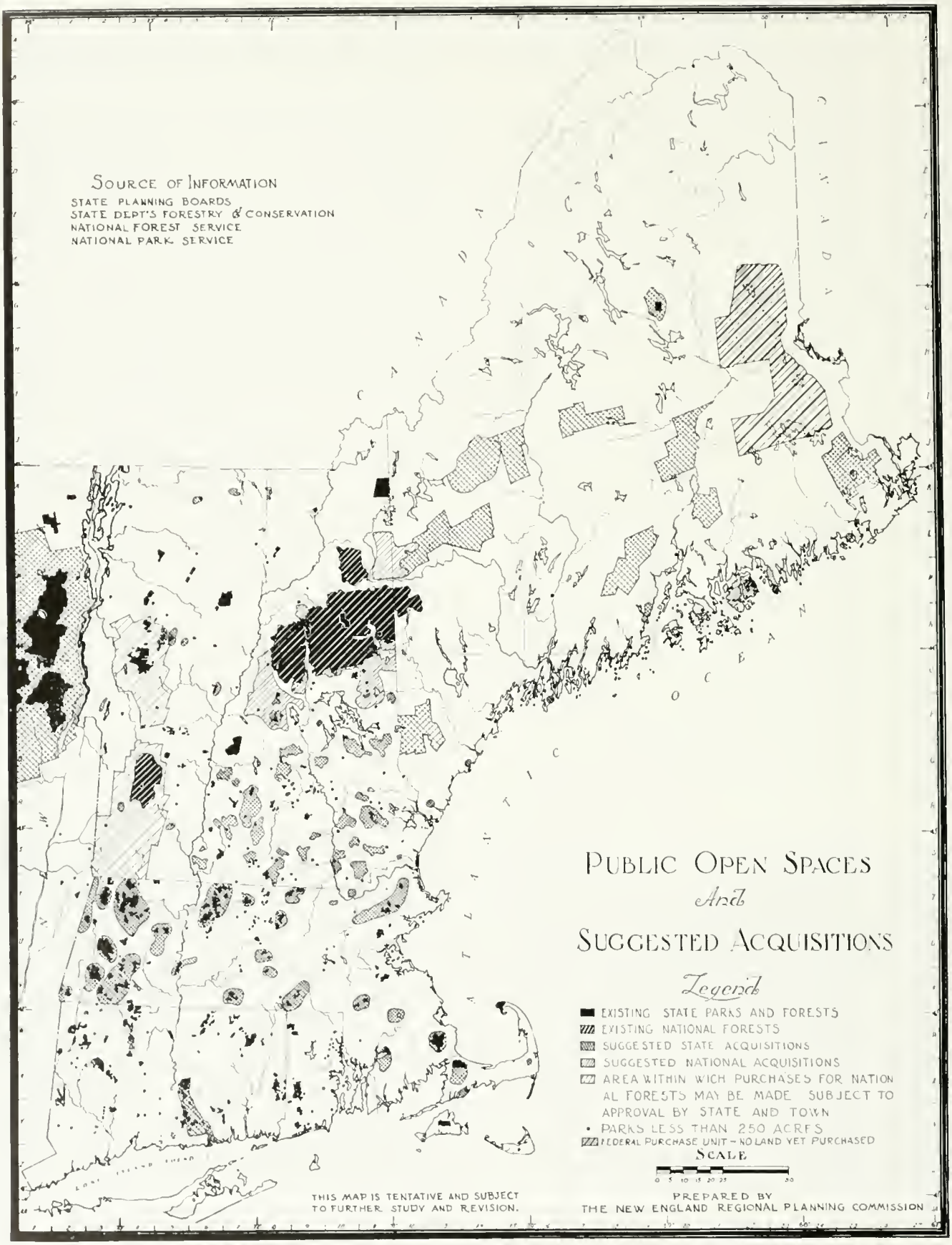
Publicly owned lands.—The tradition of holding land in private hands as a primary source of wealth has been a powerful factor in New England forestry. Nevertheless, when private ownership has failed to manage forest areas in a manner calculated to protect timber resources, watersheds and wildlife and to develop recreational potentialities, public agencies have often purchased land sufficient for these purposes. Originally these public-land purchases were for fire protection and watershed control. Today public ownership has been extended to include areas essential for recreational development, wildlife conservation,

Photo by courtesy of New England Council.

FIGURE 35.—Pulpwood is an important product of New England forests.

Photo by Lockard

FIGURE 36.—Reforestation is a valuable part of the CCC program in New England.


SOURCE OF INFORMATION
STATE PLANNING BOARDS
STATE DEPT'S FORESTRY & CONSERVATION
NATIONAL FOREST SERVICE
NATIONAL PARK SERVICE
CANADA
ATLANTIC OCEAN
PUBLIC OPEN SPACES
And
SUGGESTED ACQUISITIONS
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EXISTING STATE PARKS AND FORESTS
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AREA WITHIN WICH PURCHASES FOR NATIONAL FORESTS MAY BE MADE SUBJECT TO APPROVAL BY STATE AND TOWN
• PARKS LESS THAN 250 ACRES
FEDERAL PURCHASE UNIT – NO LAND YET PURCHASED
SCALE
0 5 10 15 20 25 30
THIS MAP IS TENTATIVE AND SUBJECT TO FURTHER STUDY AND REVISION.
PREPARED BY
THE NEW ENGLAND REGIONAL PLANNING COMMISSION

FIGURE 37

and timber production. Further, the benefits resulting from fire and pest control and scientific forestry practice are not confined to the land actually in public ownership, but are often extended beyond its borders by cooperation with the owners of the adjacent land.

There are now about 600 tracts in public ownership in New England, and they include nearly 1,300,000 acres. All but three of the tracts are in local or State ownership; yet these three, in Federal ownership, comprise 900,000 acres (the White Mountain National Forest alone contains over 700,000 acres). The distribution of these public lands is shown by the accompanying map, page 32. This map shows also some additional areas which various agencies have suggested for public acquisition. Aside from the large Federal purchase area in eastern Maine and some additions to the White and Green Mountain National Forests, all the proposed areas shown are for State purchase. If these suggestions were carried out, about 6 million acres would ultimately become publicly owned. The State planning boards and the New England Regional Planning Commission are studying these suggestions.

Problems

Most of the forestry problems of New England concern cut-over forest land, and land which was cleared and put into crops during a different economic era, but which has now proved to be submarginal for agriculture. Much of this land, most of it suited to timber production, has been abandoned. Tax delinquency and depreciation of land values have followed. Modern forestry practices and modification or adjustment of present taxation methods are necessary for the rehabilitation of this land if it is to remain in private ownership.

Federal and State forest departments are doing much toward the development of scientific methods of forest management through the establishment of demonstration forests and through the educational program of forest and agricultural experiment stations. Private educational institutions have also contributed toward this development through the work carried on in their demonstration forests.

The New England States in general have laws exempting growing timber from taxation, but more or less uncontrolled assessment of general property taxes has done much to discourage private forestry development. Under a severance tax the timber would be assessed separately from the land and preferably taxed only when cut. General adoption of such a tax would stimulate reforestation of idle land.

Conclusion

New England is a natural forest area, and forestry is a major industry. However, it has been estimated that the productivity of New England forests could be quadrupled by wise forest management. A program designed to stimulate a greater interest in forestry was adopted by the New England Forestry Congress, held in Hartford, Conn., in 1929. This "Program for the Development of Forest Resources in New England", for the decade 1929–39, is as follows:

Objective A.—To restore the depleted and deteriorated forests of New England to full productiveness, that they may render the maximum service to the region as sources of raw materials for the industries, for watershed protection, and for recreational and scenic values.

Means.—1. The early completion of the program of Federal forest acquisition in Maine, New Hampshire, and Vermont as already determined, involving the purchase of 440,000 acres of land.

2. The extension of State ownership of forest land to include ultimately at least 10 percent of the forest area of the region in order:

(*a*) To better protect areas affecting stream flow and controlling floods.

(*b*) To build up in regions of small scattered ownership, large State holdings, which will produce dependable amounts of wood to support local industries.

(*c*) To serve as demonstrations of forestry practice, and of forest management for the instruction and education of private owners.

(*d*) To serve as open hunting and fishing areas, as sanctuaries for propagation of game birds and animals, and as recreational areas.

(*e*) Ultimately to produce net revenue for the State.

3. The extension of town forest until every organized town containing suitable forest land shall own a forest to include ultimately 10 percent of its forested area.

(*a*) For public use in recreation, and for bird and game sanctuaries.

(*b*) For demonstration of forestry practice.

(*c*) Ultimately for town revenue from wood crops.

Objective B. The creation of more favorable conditions for the private owner of forest land, which will encourage him to preserve and improve existing forests, and to reforest additional land.

Means.—1. The improvement of fire prevention and suppression methods until the average area burned annually becomes negligible (one-tenth of 1 percent or less) and the forest property becomes an insurable risk at reasonable rates.

(*a*) By strengthening the State forest fire protective organization to the point of maximum efficiency, which will secure the lowest obtainable combined cost for fire prevention, fire fighting, and fire losses.

(*b*) By coordinating State supervision with town fire organizations so as to create perfect controlled coordination throughout the State for fire prevention.

(*c*) By securing completely adequate equipment for fire fighting and detection.

(*d*) By thorough-going education of the public with regard to fire prevention.

(*e*) By securing maximum cooperation of land owners in fire prevention, preferably through the organization of cooperative associations, with State assistance.

(*f*) By cooperation with the United States Forest Service.

2. The improvement of protective measures against forest insects and diseases.

(*a*) By upholding the quarantine laws against foreign importations.

(*b*) By cooperation with the United States Department of Agriculture in preventive measures and control.

(*c*) By strengthening State inspection, and quarantines, and State aid.

(*d*) By education of private owners.

3. The modification of tax laws and taxing systems so as to secure equality of tax burdens on forest land owners as compared with other individuals.

(*a*) By analysis of the tax situation in forested towns, with respect to town expenditures, sources of town revenue, and distribution of the tax burden.

(*b*) By consideration of the relation of taxes on forest lands and young timber with reference to the ultimate income from yields of mature timber.

(*c*) By considering the public benefits arising from the growing of timber by private owners, as contrasted with State ownership, and expenditure for similar purposes.

4. The study of markets for forest products and of possibilities of increasing the income from timberlands.

(*a*) By disseminating information on markets and classes of products salable.

(*b*) By efforts to create new markets for timber otherwise unsalable.

5. The securing of nursery stock for forest planting at prices based on forest needs.

(*a*) By coordinating orders for privately grown stock when private industry furnished satisfactory supplies at reasonable prices.

(*b*) By growing stock in State nurseries to supply private needs, at lowest possible cost for reforestation.

Objective C.—The extension of basic knowledge of forestry practice.

Means.—Through the increased financial support of all agencies now engaged in research into the problems of growing and marketing timber, including the Northeast Forest Experiment Station of the United States Forest Service, State forestry research departments, and research in schools of forestry, or by foundations.

Objective D.—The protection of the public health, promotion of happiness, and the increase of the general attractiveness of New England to residents and visitors, through recognition of the necessity of public ownership and control of small areas of high scenic and recreational value, by the creation of systems of parks embracing sea and lake shores, waterfalls, mountain scenery, roadside areas, remnants of primeval forest, and sites of historic interest.

Objective E.—An organized effort to educate all elements of New England business, professional, civic, and social life, to a true recognition of the overwhelming importance of the forests of New England in regional plans for future prosperity and development.

STAFF REPORT—SECTION III
RECREATION

Introduction

New England is endowed with excellent facilities for all types of recreation. The distance from any point to mountains, beaches, wilderness, sea, lakes, streams, hills, and coast is never more than a day's drive. There are more than 2,000 miles of varied coast line, extending from the rocky shores of Maine to the sandy beaches of Long Island Sound. There are more than 5,000 lakes, varying in type from the Grand Lakes in the wilds of Maine to Lake Winnipesaukee, in a highly developed resort region, and from 75-mile-long Lake Champlain to the myriad little ponds all over New England. The entire area is characterized by rugged topography, which culminates in the White Mountains, containing the nine highest peaks in northeastern United States, and in Cadillac Mountain, the highest peak on the Atlantic seacoast.

New England climate is as favorable to recreational enjoyment as is its topography. Cool, moist summers make it an ideal summer vacation region; its snowy winters make it popular as a winter resort. Summer sports activities commence along the southern coast before skiing is over in the White Mountains. The long, mild spring and the clear, crisp autumn, with its brilliant foliage, are conducive to long drives in the country.

FIGURE 38.—Wooded glades, deep ravines, luxuriant foliage, and lofty peaks, combined with other natural resources make New England an ideal recreation land.

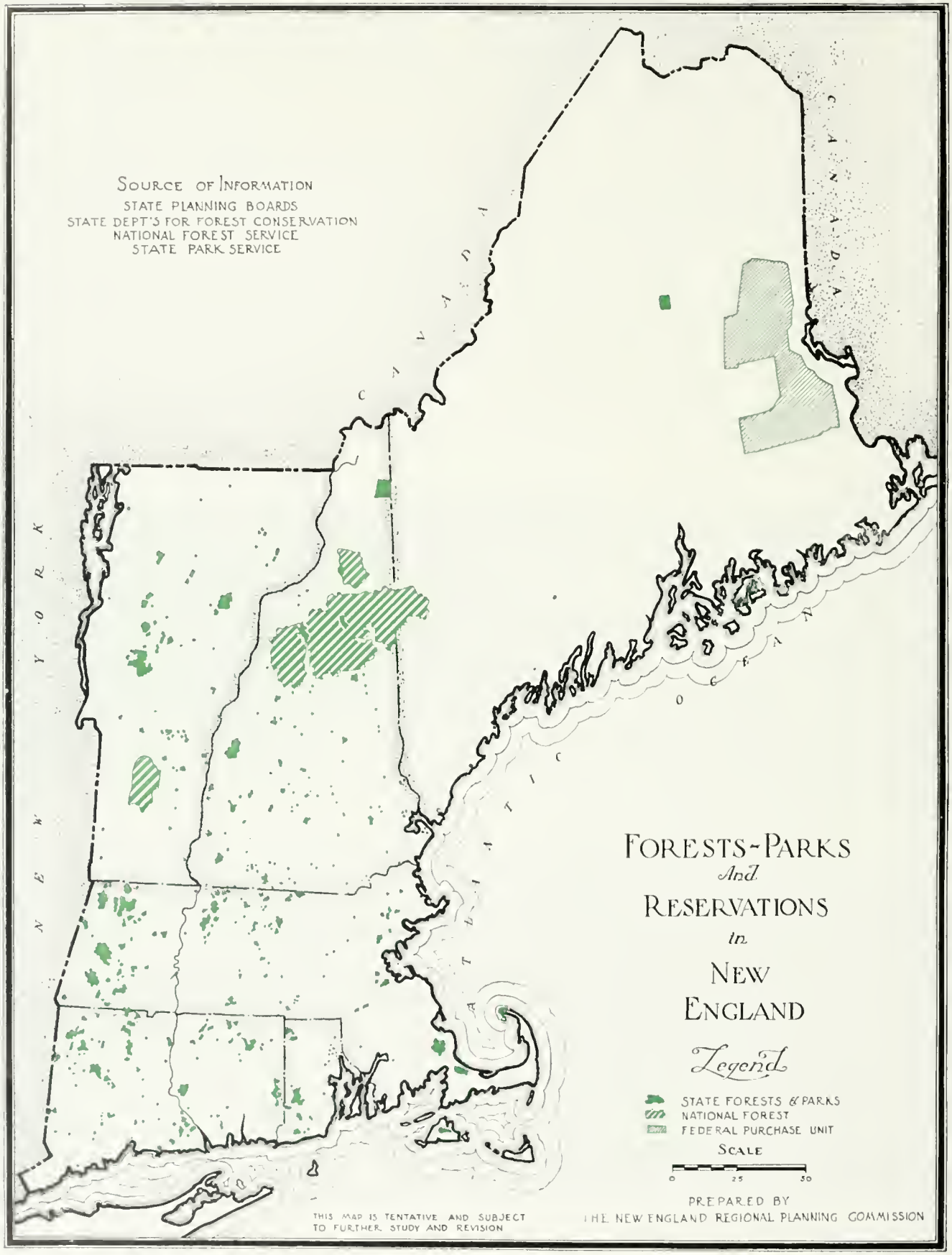
SOURCE OF INFORMATION
STATE PLANNING BOARDS
STATE DEPT'S FOR FOREST CONSERVATION
NATIONAL FOREST SERVICE
STATE PARK SERVICE
CANADA
CANADA
NEW YORK
ATLANTIC OCEAN
FORESTS-PARKS
And
RESERVATIONS
In
NEW
ENGLAND
Legend
STATE FORESTS & PARKS
NATIONAL FOREST
FEDERAL PURCHASE UNIT
SCALE
0 25 50
THIS MAP IS TENTATIVE AND SUBJECT TO FURTHER STUDY AND REVISION
PREPARED BY
THE NEW ENGLAND REGIONAL PLANNING COMMISSION

FIGURE 39

New England has a fairly regular rainfall, evenly distributed throughout the year. Statistics show that the average monthly precipitation is between 3 and 4 inches, and that there are no prolonged periods either of rain or of excessive drought. In northern New England the ground is usually covered with snow throughout the entire winter season, but due to the ocean and temperature variations there is relatively little snow in southern Rhode Island and southeastern Massachusetts.

In addition to these natural assets, New England has a unique cultural quality of recreational appeal. Historic sites and buildings; village commons, with their colonial churches and town halls; "forty-rod" streets, lined with stately elms; distinctive groupings of farm houses and buildings; stone-walled fields dotted with cedar and juniper—all these reminders of the past form a distinctive background for the New England of today.

The values of these recreational attributes have been both enhanced and impaired. Highways and overnight accommodations have made most areas accessible to tourist and vacationist. The development of facilities, the creation of artificial lakes, and the presence of those picturesque reminders of early New England, have added to the natural attractions. However, the pollution of streams, the destruction of forest cover, and the intrusions of commercial and industrial development have retarded recreational growth.

In the past the development of agricultural, commercial, and industrial potentialities has been paramount. Yet the development of recreation is now assuming an equal importance. The increase in leisure time has resulted in a comparable increase in out-door recreation. And increased transportation facilities have made New England's playground accessible to people from all parts of the country.

One-fourth of the people in the United States and Canada live within a day's drive of New England, and over half of the largest cities in the two countries lie within 900 miles of Mount Washington. This proximity of centers of population, in combination with excellent natural facilities, has made New England a prominent recreational region.

Recreation in New England presents a two-fold problem: (1) to provide out-of-door recreational opportunities for the use of the resident population; (2) to develop the region as a national recreational area for a source of income to many people in the region. The first aspect assumes great importance because of the density of population, particularly in the three Southern States. The importance of the second or economic aspect is shown by the fact that New England recreation attracted 3 million visitors in 1935, and accounted for an expenditure of over 400 million dollars.

From the point of view of the New England region, both phases of the problem depend primarily on the same factors: (1) the preservation of natural recreational areas; (2) the development of recreational facilities; and (3) the provision of access to recreational areas.

The Situation

In New England and similar regions where the possibilities for recreational development are comparatively unlimited, the problem is not so much the actual provision of adequate facilities, as the selection of the locations most suitable for them—not of making the most use of what few opportunities exist, but of making the best use of each of the many potentialities.

The solution of the problem depends upon a thorough understanding of these potentialities and of the degree to which they have been developed. This requires an exhaustive recreation survey. The National Resources Board, in its report to the President, December 1, 1934, recommended that " a complete and comprehensive study and analysis of present State and regional agencies concerned with State conservation and recreation, and of scenic and natural resources of each State, be made as a basis for determining how they can be conserved, developed, and utilized, both through public and private initiative."

The National Park Service, through its regional office, has laid the foundation for a comprehensive survey throughout New England, and has cooperated with the National Resources Committee in arranging for the compilation of much of the basic data in connection with the Writers' Project of the Works Progress Administration. A bill introduced in the 1936 session of Congress would authorize the National Park Service to make a comprehensive study of all lands in the United States which are or may be chiefly valuable as recreation areas.

At present the only data available on New England recreation are the results of those diversified studies which have been effectively carried out by the United States Forest Service (on areas over which it has direct jurisdiction); the State planning boards; State conservation, forest, and park commissions; and the New England Council. The Commission has compiled this data for use as a basis for its studies of recreation conditions and problems.

Policies of Public Land Acquisition.—Public open spaces in New England, especially forests, have been acquired in the past primarily for timber and watershed protection, but an increasing number of them are

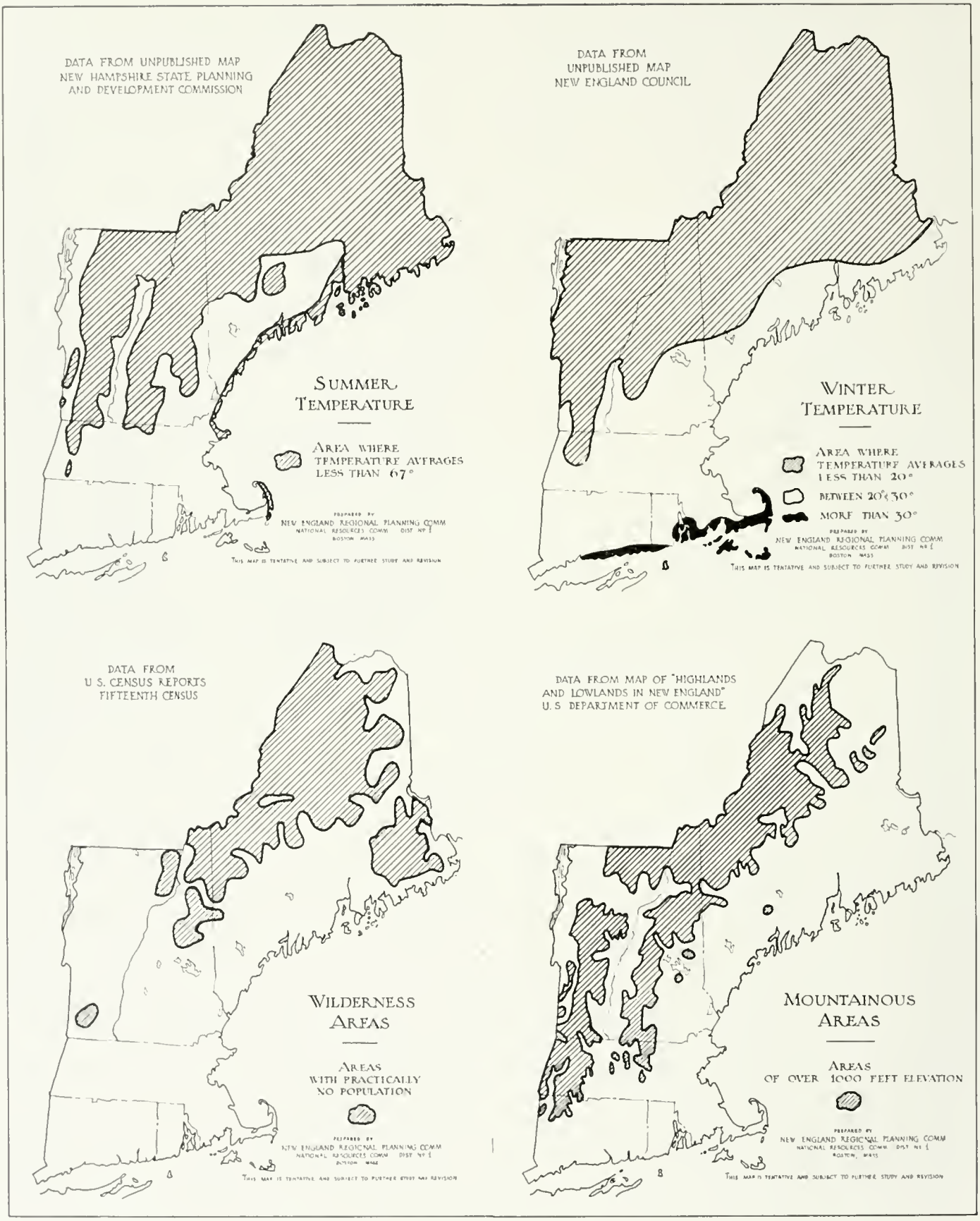
DATA FROM UNPUBLISHED MAP
NEW HAMPSHIRE STATE PLANNING
AND DEVELOPMENT COMMISSION
SUMMER
TEMPERATURE
AREA WHERE
TEMPERATURE AVERAGES
LESS THAN 67°
PREPARED BY
NEW ENGLAND REGIONAL PLANNING COMM
NATIONAL RESOURCES COMM DIST NO 1
BOSTON MASS
THIS MAP IS TENTATIVE AND SUBJECT TO FURTHER STUDY AND REVISION
DATA FROM
UNPUBLISHED MAP
NEW ENGLAND COUNCIL
WINTER
TEMPERATURE
AREA WHERE
TEMPERATURE AVERAGES
LESS THAN 20°
BETWEEN 20 & 30°
MORE THAN 30°
PREPARED BY
NEW ENGLAND REGIONAL PLANNING COMM
NATIONAL RESOURCES COMM DIST NO 1
BOSTON MASS
THIS MAP IS TENTATIVE AND SUBJECT TO FURTHER STUDY AND REVISION
DATA FROM
U S. CENSUS REPORTS
FIFTEENTH CENSUS
WILDERNESS
AREAS
AREAS
WITH PRACTICALLY
NO POPULATION
PREPARED BY
NEW ENGLAND REGIONAL PLANNING COMM
NATIONAL RESOURCES COMM DIST NO 1
BOSTON MASS
THIS MAP IS TENTATIVE AND SUBJECT TO FURTHER STUDY AND REVISION
DATA FROM MAP OF "HIGHLANDS
AND LOWLANDS IN NEW ENGLAND"
U. S DEPARTMENT OF COMMERCE
MOUNTAINOUS
AREAS
AREAS
OF OVER 1000 FEET ELEVATION
PREPARED BY
NEW ENGLAND REGIONAL PLANNING COMM
NATIONAL RESOURCES COMM DIST NO 1
BOSTON, MASS
THIS MAP IS TENTATIVE AND SUBJECT TO FURTHER STUDY AND REVISION

FIGURE 40

being devoted to recreational use. A study of New England conservation policies shows a trend towards increasing emphasis on the recreational value of public lands. The following summary indicates how these changing policies are affecting the acquisition of lands for recreational purposes.

The supervisor of the White Mountain National Forest states that "in the management of the above (Green Mountain and White Mountain) National Forest areas recreation development is considered as one of the four major activities, the other three being timber production, watershed protection, and wildlife propagation."

The National Plan for American Forestry, published by the United States Forest Service in 1933, stated that "the use of the forest for recreation has received such entirely inadequate study that the first recommendation of a realistic program should be for a careful survey of forest recreational requirements."

The National Park Service has only one New England area under its direct jurisdiction at the present time—Acadia National Park, Maine. This was acquired to protect an area of outstanding scenic beauty, and to preserve and develop it for educational and recreational use. The Resettlement Administration is now buying land for four recreational demonstration projects. This land, in general unsuited to agriculture, is so located in respect to centers of population that it will satisfy a definite need for low-cost recreational facilities. An act of the 1935 session of Congress instructed the Secretary of the Interior, through the National Park Service, to make a study of all historic sites in the country, with a view to recommending which of these should be preserved by the Federal Government as national reservations.

Courtesy Vermont Department of Agriculture

FIGURE 41.—Quaint covered bridges contribute local color and charm to the rural New England picture.

The Maine Forest Service maintains 146 camp sites on leased land, but controls no other recreation areas. The only State recreation areas in Maine are Baxter State Park (administered by a special commission) and the small military reservations or historic forts. However, the recently established State Park Commission is considering the acquisition of several areas with a view to recreational development, particularly the Salmon Falls Reservation, which the Appalachian Mountain Club has offered to donate to the State.

The New Hampshire Forestry and Recreation Department formerly received State appropriations "to purchase needed areas for the practice and demonstration of forestry." Most of the early purchases were for the development of forestry, but more recent acquisitions have had recreation as a supplementary or primary object, and the forestry department has become increasingly aware of the need for protecting recreation areas. In 1933 the State legislature recognized this trend in policy by adding to the State forest laws a provision whereby any public forest lands "may be used for public recreational and park purposes." In 1935 the legislature changed the name of the Forestry Commission to "Forestry and Recreation Commission", and appropriated $23,000 for recreational maintenance during the current biennial period.

The Vermont State forests are devoted to general forestry—reforestation, fire prevention, and blister-rust control. Game preservation and hunting are important secondary considerations. Most of the forests were bought for these purposes, but many recreational facilities have been developed on these areas as part of the Emergency Conservation Work program. Since 1929 the Vermont Forestry Department has been authorized to acquire "State forest parks." These parks differ from State forests in that they "have recreation as a primary use."

The Massachusetts Department of Conservation was formerly allowed to acquire State forests "to be devoted to the establishment of demonstration forests, the raising of timber, and other silvicultural practices." This department now reports that "recreation is the most important byproduct of our forests", and that in the development of forests, "having set aside recreational areas and a wildlife sanctuary, the rest is turned over to the State forester to be developed on a forestry basis." The aim of the Commission in working out its "Massachusetts plan" is to have "no center of population * * * more than 20 miles from a forest park."

The former Rhode Island Bureau of Forestry did not mention recreation among its "regular activities"; but its "plan for State forest acquisition" implied that the proper function of State forests was to "render maximum service to the region as sources of raw mate-

rials, for watershed protection, and for recreation values." In 1935 a legislative act set up the Division of Forests, Parks, and Parkways in the Department of Agriculture and Conservation, combining the functions of the Bureau of Forestry and the Metropolitan Park Commission. The act further provides for the coordination of land conservation and land-use programs with particular emphasis on recreation.

The Connecticut State Park and Forest Commission divides public lands into two classes. Parks are acquired for recreational purposes and are developed "as recreation grounds for citizens and their guests." Forests are developed primarily for forestry and conservation, their incidental recreational value depending on "the opportunities offered people to enjoy solitude." However, there are many areas in these forests which are developed for recreation, and all such areas are used to capacity.

National Recreation Areas.—From the somewhat limited information on public open spaces in New England the following summary has been evolved. The Federal Government owns three large tracts (as well as four "demonstration" areas): the White and Green Mountain National Forests and the Acadia National Park. Each has important recreational areas and has undergone extensive recreational development. The White Mountain forest is an interstate area, but all three have interstate significance, due to their great attraction for out-of-State people.

Statistics on national forest areas are constantly changing as title to lands held under purchase agreement passes to the United States and as purchase boundaries are shifted. Yet the acreages as of June 30, 1932, the approximate acreages in January 1936 and expected ultimate acreages are shown below:

	1932	1936	Ultimate
Green Mountain Forest	31,491	169,000	500,000
White Mountain Forest	534,735	708,000	830,000

Examination proceedings were initiated in the fall of 1935 with reference to a 132,000-acre tract in the 875,000-acre Grand Lake purchase unit in eastern Maine. In 1935 the Maine Legislature authorized Federal purchase, for national forest purposes, of 600,000 acres within this purchase unit.

Recent information reveals that Acadia National Park has a total of 12,108 acres, with additional acreage being acquired in Acadia Park extension as a recreational demonstration project. The other three recreational demonstration projects are the Camden Hills area in Maine, the Bear Brook project in New Hampshire, and the Beach Pond area in Rhode Island.

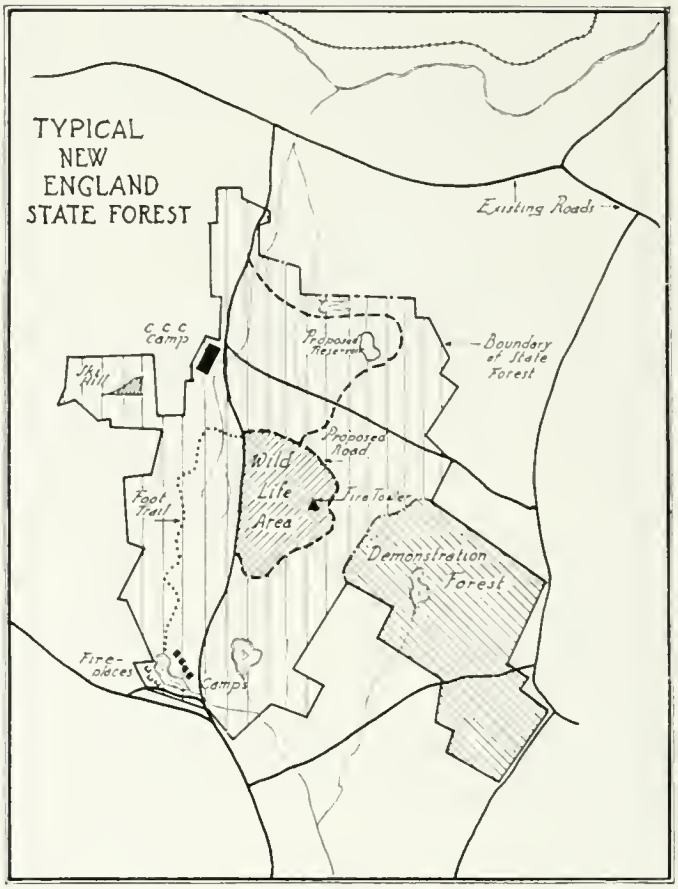

FIGURE 42

No figures are yet available regarding the amount of land to be acquired, but preliminary maps indicate that the total for the four projects will be about 40,000 acres.

State Recreation Areas.—According to the 1934 report of the National Resources Committee, "A distinction should be maintained between areas set aside because of scenery, history, or natural wonders for inspirational and educational purposes as contrasted with areas producing timber or forest products, on both of which large recreational values can be developed without interference with their primary purpose." Except in a few general classifications, New England has not made the distinction between the different types of public open spaces. Therefore, the summary of State-owned lands on the following page does not distinguish, except in a very general way, the differences in use of the various areas.

Data regarding county, municipal, and semipublic recreation areas in New England are very incomplete. In Massachusetts there are 2,171 acres of land acquired by the State, but under the administration of county officials (not included in table of State-owned lands). Other than this, there appear to be no county recreation areas. In addition to the countless municipal

parks and playgrounds, there are about 50,000 acres of town forests. Very few of these forests have any recreational use.

[Corrected to Feb. 1, 1936]

Classification	Area	Use
Maine:	*Acres*	
Baxter State Park	5,960	Recreation wilderness.
Other State parks	122	Recreation.
Military reservations	218	Historic forts.
Total	6,300	
New Hampshire: State forests	38,376	Conservation and recreation
Vermont:		
State forests	44,236	Primarily conservation.
State forest parks	8,778	Primarily recreation.
Total	53,014	
Massachusetts:		
State forests	168,291	Conservation and recreation.
State forest parks	2,406	Recreation.
State reservations	12,060	Primarily recreation.
Metropolitan district reservations	12,615	Recreation and parkways.
Total	195,372	
Rhode Island:		
State forests	532	Conservation.
State parks	5,444	Conservation and recreation
Total	5,976	
Connecticut:		
State forests	65,557	Conservation and recreation.
State parks	11,593	Recreation.
Game sanctuary	[1] 6,500	Game preservation.
Total	83,650	
Total State-owned lands	382,688	
Total Federal lands	889,108	
Grand total	1,271,796	

[1] Approximately.

There are many types of semipublic reservations in New England, of which a few of the more important are—

State-owned recreation areas

Public shooting grounds, in Connecticut: About 36,000 acres of State-leased private lands open, under State regulations, to hunting.

Game preserves, in Maine: Over 400,000 acres of private land protected against hunting by act of legislature.

Reservations of the Massachusetts Trustees of Public Reservations and of the Society for the Protection of New Hampshire Forests: 1,582 acres in Massachusetts, and 6,559 acres in New Hampshire, or a total of 8,141 acres of land of especial scenic value, opened to public enjoyment and hence exempt from taxation. In addition to the reservations now held by these two societies, they have acquired and donated to their respective States many areas of recreational value.

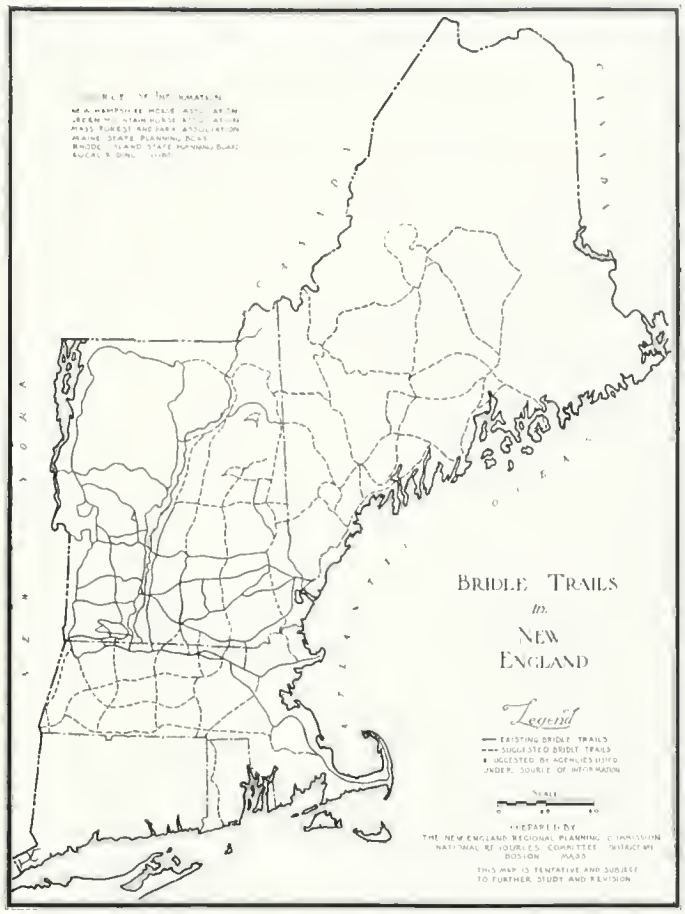

FIGURE 13

The location of State and Federal open spaces, and of some important semipublic areas are shown in figure 39.

Access to Recreation Areas.—A discussion of access to recreation areas from a regional point of view must be general, since detailed studies require local consideration. The New England highway pattern permits access to recreation areas, except parts of the Maine wilderness, but means of communication between some northern centers is insufficient for tourist traffic. Many New England highways are not adapted to recreational use because they are either inadequate, unsafe, or over-developed commercially.

In the past New England highways adequately connected population centers with recreation areas, but in the future additional means of circulation must be provided between recreation areas. Such routes, if properly located, designed, and protected, will become an integral part of the recreation system.

Touring.—Millions of people spend their vacations driving through New England, visiting scenic and historic spots. For their enjoyment the highways must not only be conveniently located and properly protected, but they must also be designed to meet other

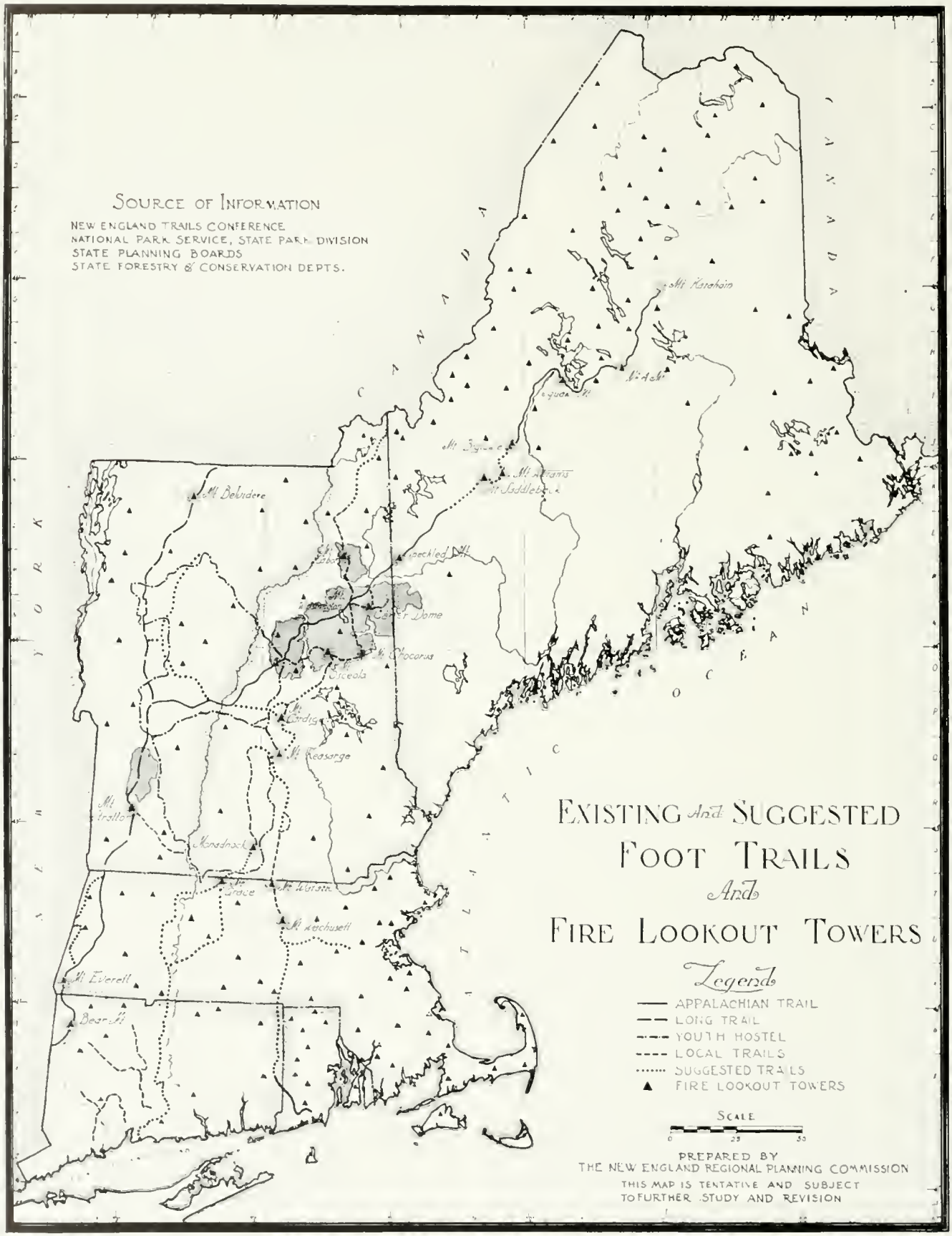
SOURCE OF INFORMATION
NEW ENGLAND TRAILS CONFERENCE
NATIONAL PARK SERVICE, STATE PARK DIVISION
STATE PLANNING BOARDS
STATE FORESTRY & CONSERVATION DEPTS.
CANADA
NEW YORK
ATLANTIC OCEAN
Mt Katahdin
Mt Bigelow
Mt Abraham
Mt Saddleback
Mt Belvidere
Speckled Mt
Cannon Mt
Mt Osceola
Mt Cardigan
Mt Kearsarge
Mt Grace
Mt Everett
Bear Mt
EXISTING And SUGGESTED
FOOT TRAILS
And
FIRE LOOKOUT TOWERS
Legend
APPALACHIAN TRAIL
LONG TRAIL
YOUTH HOSTEL
LOCAL TRAILS
SUGGESTED TRAILS
FIRE LOOKOUT TOWERS
SCALE
0 25 50
PREPARED BY
THE NEW ENGLAND REGIONAL PLANNING COMMISSION
THIS MAP IS TENTATIVE AND SUBJECT
TO FURTHER STUDY AND REVISION

FIGURE 44

needs of the tourist. The countless historic shrines, the architectural masterpieces, and the picturesque villages, with their church spires and characteristic "commons", constitute some of New England's chief attractions. These points of interest must be made accessible, but they must also be protected from the ravages of commercial growth. The preservation of their charm depends on keeping such sites free from wayside stands, filling stations, and billboards; and undisturbed by wide, noisy traffic arteries. It is necessary that bypasses for through traffic be provided if the distinctive charm and quality of New England villages are to be maintained. Access to these sites can and should be provided in such a way as not to impair their real value.

The tourist often has difficulty in finding these scenic and historic points, even if they are spotted on maps. Therefore, guide books similar to the Connecticut Guide, issued by the Connecticut State Planning Board, are of great assistance. The National Guide Book now being prepared under the writers' project of the Works Progress Administration will also be of value to the tourist.

Facilities

Recreational facilities in New England are unlimited in variety, and are too numerous to warrant consideration in any but a detailed study. However, the staff of the Commission has assembled some data on the more important facilities for extensive recreation: The various types of trails; and on some of the more commonly enjoyed types of intensive recreation—hunting and fishing, golfing, yachting, camping, and winter sports. The following discussion indicates, in general, the scope of New England's recreational problem from the standpoint of facilities.

Foot Trails.—There are innumerable mountain trails in New England, of which the two longest are the Appalachian Trail from Mount Katahdin, Maine, to Mount Oglethorpe, Ga.; and the Long Trail in Vermont, extending from the Massachusetts State line (it coincides for its first hundred miles with the Appalachian Trail) to Jay Peak, near the Canadian border (fig. 44). The New England section of the Appalachian Trail is open and marked except for a short stretch in western Maine.

New England tramping trails have a mileage of well over 3,500; in the White Mountain National Forest alone there are nearly 1,000 miles of trails. The various trail clubs and public agencies are affiliated with the New England Trail Conference, which is working to extend tramping facilities, particularly in the more densely settled States of southern New England, and to promote their use by the public. Trail development is being planned for New England as a whole through the efforts of this Conference and its cooperating agencies. Complete data has not yet been assembled on the local trails, which are to be found on most of the mountains and large public open spaces.

Youth Hostels.—A chain of inexpensive overnight accommodations for hikers and bicyclists was opened in June 1935 by a private organization interested in encouraging young people to make a healthful and enjoyable use of leisure time. This type of facility, under the name of Youth Hostel, has proved very popular throughout Europe. The chain extends from Northfield, Mass., over a 500-mile circuit through the White and Green Mountains. Most of the route follows existing byroads, although some parts include heavily-traveled highways. Realizing the danger of locating such routes along major highways, and recognizing the growing public demand for hiking and cycling trails in conjunction with inexpensive lodging, the National Park Service is investigating the possibility of developing such facilities on public land away from traveled roads. A preliminary report has been published which sets forth some of the major factors involved in the planning of these facilities.

Bridle Trails.—There has been increased interest in bridle and horseback trails during the past 5 years. The Green Mountain and New Hampshire Horse Association and the Massachusetts Forest and Park Association have marked and published guide books for approximately 2,000 miles of public byroads for this use in their States. Overnight and stabling accommodations are provided at convenient intervals, in most cases by private hostelries catering to horseback

Harold Orne

FIGURE 45.—Beautiful New England summer homes provide rest and comfort during the vacation months.

riders. Extensions of existing and development of new trails are proposed by State and private agencies. Interstate connections are needed between many of the existing and suggested trails.

Canoe Routes.—Although there are miles of good streams in New England unspoiled by industrial development and pollution, many large rivers are unsuitable for canoeing. Yet the public is taking increased interest in canoe trips. The best information the Commission has found on New England canoe trips is contained in "Quick Water and Smooth: A Canoeist's Guide to New England Rivers", by Phillips and Cabot. The Maine State Planning Board has published a map showing the best canoe routes in that State. There is still need of establishing adequate facilities for overnight accommodations and circuit routes of travel by canoe.

Hunting and Fishing.—Hunting and fishing attract more sportsmen each year. The drain on game species has increased to the point where natural reproduction must be further supplemented by game management and semiwild methods of propagation. Biological supervision of stocking and scientific control of environment have lagged far behind the public demand for "shootable game" and "catchable fish." Protective legislation is often inadequate.

Correlation between the open season and the abundance of different species as determined by licensed holders' reports of the number and location of game and fish taken will soon be recognized by all State game departments as a necessary procedure. Stocking of game in suitable cover and semiwild methods of propagation are slowly replacing the expensive methods of artificial propagation, which result in the liberation of birds so tame that they are "living targets."

The State game departments annually stock streams and ponds with millions of fish. Careful field studies should be made with a view to limiting the wasteful stocking in waters unsuitable for survival and natural reproduction.

Cover throughout most of New England is well adapted to game, but reforestation with pure stands of timber is definitely detrimental to wildlife. Coordination of forest and general land use management with wildlife preservation is desirable, as is the standardization of technical hunting and fishing regulations.

Golf and Yacht Clubs.—There are more than 500 golf clubs in New England, two-thirds of which are located in or around urban areas. The remainder owe their existence entirely to vacationists and constitute an important attraction of this region. Although municipal courses are comparatively new, about 25 New England cities have them. The rates on these courses are exceedingly low for visitors as well as for local residents.

Although yacht clubs do not constitute a universal attraction, nevertheless there are many yachting en-

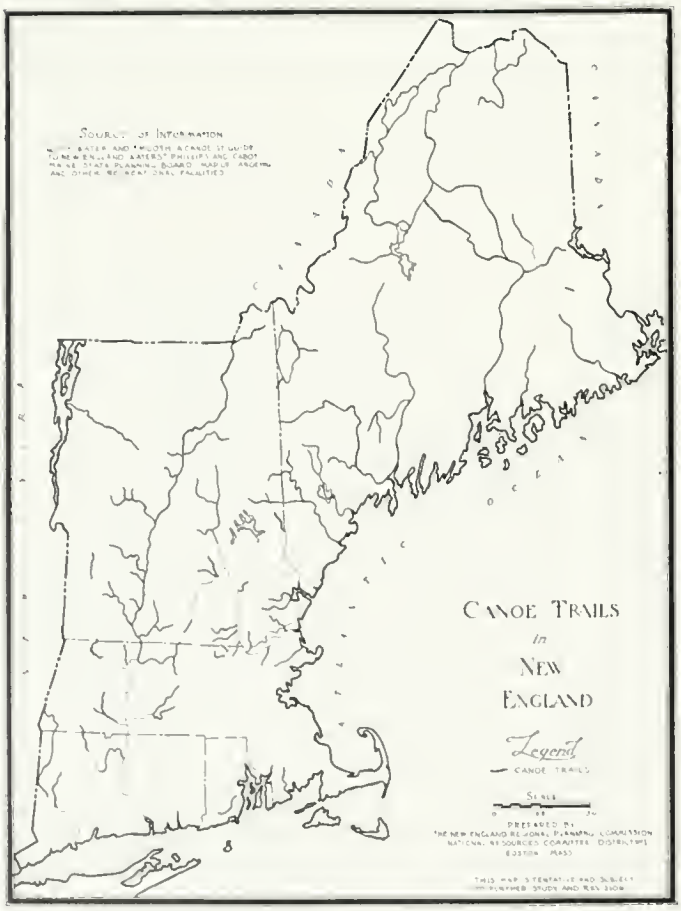

FIGURE 46

Courtesy Vermont Department of Agriculture

FIGURE 47.—Well stocked rivers and streams attract many disciples of Izaak Walton to New England.

thusiasts. Consequently yacht clubs dot the entire New England coast, with the exception of the outer shore of Cape Cod. This is the only stretch of the New England shore that is not well suited to all types of pleasure boating.

Juvenile Camps.—New England was first in the development of "summer camps." In 1921, according to Chidester, about 90 percent of all such camps were located here. Since then many have been opened in other sections, but New England's six hundred-odd camps still represent one-fifth of the country's total. Although New York now leads the States in actual number of camps, New England claims the distinction of having the most camps per unit area.

Winter Sports.—The development of winter sports has been rapid within the past few years, due to the improved plowing and sanding of highways; to the availability of facilities constructed largely with C. C. C. and work relief labor; to the local promotion of winter sports activities; and to the "snow trains." From 1931 to 1935, the Boston & Maine Railroad alone carried 59,305 passengers on 190 snow trains; every suitable week-end in the winter of 1935–36 thousands of enthusiasts were taken to New England winter resorts by snow trains of the Bangor & Aroostock, Boston & Albany, Boston & Maine, Maine Central, New Haven, and Vermont Central railroads. The popularity of these trips has provided the impetus, and publicity by the railroads, the State development commissions, and the New England Council has contributed in making the region a ranking winter sports center.

This increased awareness of the possibilities of winter sports development has resulted in a rapid development of facilities. Downhill and cross-country ski-trails, ski-jumps, toboggan slides, and skating rinks have been constructed by both public and private agencies. Snow trains have been supplemented by "snow busses" and "snow planes", and the popularity of winter resorts is resulting in an increased winter use of hotels, camps, and vacation homes.

Emergency Conservation Works.—The development of recreational facilities on State reservations has made great progress since 1933 by means of Emergency Conservation and State work relief funds. Recreational development has been one of the most important functions of the approximately 90 Civilian Conservation camps in New England. The significance of this activity is brought out in a statement by the State forester of Connecticut that "the development of State forests has been put ahead at least 10 years through the C. C. C. program alone."

Courtesy of Ski Village, Peterboro, N. H

FIGURE 48.—Permanent winter cabins are evidence of the popularity of winter sports in New England.

Photo by Christine L. Reid *Courtesy Boston Evening Transcript*

FIGURE 49.—The New England winter scene offers unlimited opportunities for active enjoyment of winter sports.

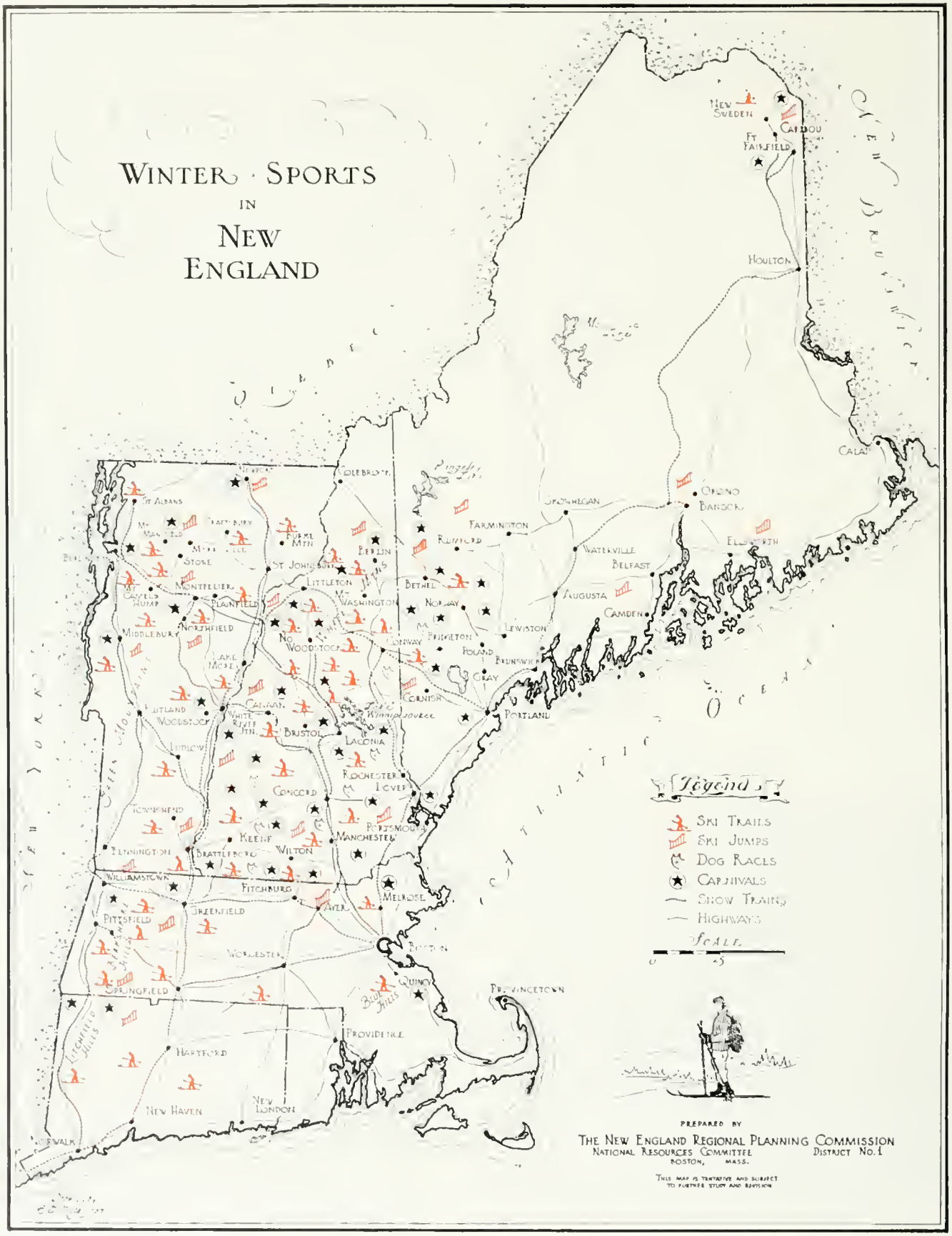
WINTER · SPORTS
IN
NEW
ENGLAND
Legend
Ski Trails
Ski Jumps
Dog Races
Carnivals
Snow Trains
Highways
Scale
PREPARED BY
THE NEW ENGLAND REGIONAL PLANNING COMMISSION
NATIONAL RESOURCES COMMITTEE
DISTRICT No. 1
BOSTON, MASS.
THIS MAP IS TENTATIVE AND SUBJECT TO FURTHER STUDY AND REVISION
Caribou
Ft Fairfield
Houlton
Old Orchard
Portland
Lewiston
Augusta
Waterville
Belfast
Bangor
Farmington
Rumford
Berlin
Bethel
Norway
Poland
Gray
Brunswick
Bristol
Laconia
Rochester
Concord
Manchester
Keene
Wilton
Peterboro
Fitchburg
Ayer
Melrose
Boston
Quincy
Worcester
Springfield
Greenfield
Pittsfield
Williamstown
Bennington
Brattleboro
Townshend
Woodstock
Middlebury
Montpelier
Barre
Northfield
Plainfield
Littleton
St Johnsbury
Lancaster
Colebrook
St Albans
Providence
Hartford
New Haven
New London
Norwalk
Provincetown
Blue Hills
Litchfield Hills
Taconic Mts
Green Mts
White Mts
Lake Champlain
Lake Memphremagog
Lake Winnipesaukee

FIGURE 50

Summaries of work done by C. C. C. and work relief projects include:

Construction of hundreds of miles of truck trails.

Cutting and marking of hundreds of miles of foot paths and trails.

Development of about 30 or 40 bathing centers, with beaches, bathhouses, modern sanitation, parking spaces.

Construction of many artificial ponds for recreation, fish conservation, storage, or general landscape purposes, including three large flood control and storage reservoirs in Vermont.

Construction of hundreds of picnic and camping sites, provided with tables, fireplaces playground equipment, parking spaces.

Development of innumerable winter sports facilities, especially ski-trails, ski-jumps, and skating rinks.

Construction of several fire lookout towers.

Fire-fighting over vast areas.

Scouting of over a million acres for forest insects and diseases.

Planting of hundreds of thousands of trees.

Cutting of thousands of cords of wood, primarily for use in C. C. C. camps.

Problems

Solution of the recreational problems in New England depends upon a thorough knowledge of conditions. Nevertheless, the situation is sufficiently well known so that a few major problems can be pointed out.

The Inter-Relationship between Public and Private Recreational Activity.— There is marked need of establishing definite policies in regard to the proper fields for public and for commercial recreational activity in New England. The recreational assets of this region constitute the means of livelihood for thousands of New Englanders, yet undue commercialization of these assets "would be not only to kill the proverbial goose, but to be unworthy of our trusteeship." This problem of defining the respective spheres of public and private enterprise is manifested in three different phases of recreational development.

The first is ownership of land. The existing status of public areas has been discussed, as well as the general policies regarding their acquisition. Yet there is need for much study in order to determine just how far public agencies should go in purchasing land for recreational purposes. Proximity to public land often serves as a direct stimulus for recreational development; yet if too much property is withdrawn from taxation, the burden on the general public becomes unreasonably great. Public ownership is often necessary for the preservation of scenic and historic features. In many cases, however, these features have been satisfactorily preserved by such private organizations as the Massachusetts Trustees of Public Reservations, the Society for the Protection of New Hampshire Forests, and the Appalachian Mountain Club. The buying of "scenic easements", that is, paying for the protection of scenic features on private land rather than buying the land outright, has been advocated by many conservation and recreation experts, and in a few cases has been resorted to by the Metropolitan Park Commission of Boston.

Another phase involves the preservation of historic and unique cultural features. Many of these recreational assets have been satisfactorily preserved under private or semipublic ownership; a few have had public protection. However, many others have suffered or have been destroyed as a result of private exploitation. Comparatively few of these sites can feasibly be

Photos by Robert F. Mazey *Courtesy Maine Development Commission*

Courtesy Connecticut State Planning Board

FIGURES 51 and 52.—From the rocky shores of Maine to the sandy beaches of Long Island Sound the New England coast offers all forms of seaside recreational activities.

placed under public ownership, and yet they are all assets to recreation in New England. In some cases zoning has reduced the depreciation of these assets; in other instances private restrictions have worked out well. Nevertheless, some measures should be developed, if possible, whereby these distinctive characteristics can be permanently preserved for public enjoyment without imposing an unwarranted burden on either public or private enterprise.

The third phase is the provision of facilities, which must likewise be carefully balanced between public and private agencies. Formal overnight accommodations constitute an important factor in New England's recreation business, yet accommodations for the thousands who prefer to camp out are no less important. Trails, winter-sports facilities, and areas for organized sports may be provided by private or commercial agencies, but public convenience and interest require that such facilities be provided by public agencies as well.

A general policy which will harmonize the interests of both public and commercial recreation agencies constitutes the greatest need of New England recreation today.

Public Land Acquisition.—Where public land acquisition involving more than one State is found to be desirable, it should be coordinated by cooperative State agreements. Recreational and natural features transcend political boundaries, therefore the acquisition program should not be impeded by these boundaries. State and Federal agencies have shown definite interest in the interstate coordination of public land acquisition, and it is hoped that the recreation committee of the Commission may assist in working out an acquisition program for New England. Further development of this program may result through the use of interstate compacts, if they are made legal in the several States.

Facilities for Extensive Recreation.—The provision of facilities for extensive recreation is both a State and a regional problem. Foot trails, for the most part, have already been coordinated into a regional network, but bridle trails still need many interstate connections. Most of these trails have been developed privately, but public cooperation is necessary in extending existing ones, and in protecting the natural features of the country through which they pass. State agencies have assisted in putting trails through their present holdings, but in the future trail location should have a bearing on land acquisition. The National Park Service has been studying the desirability of "trailway" development for through-trails on strips of publicly owned land.

Trail marking and the provision of accommodations are logically subject matter for regional planning.

Courtesy of New England Council

FIGURE 53.—The recreational assets of New England include hundreds of beautiful lakes in natural settings of woods and mountains

The excellence of New England foot trails, especially in regard to standardized marking and distribution of shelters at desirable locations, is due largely to the coordinated efforts of the New England Trail Conference and its constituent organizations. Further successful development depends chiefly upon the extent to which the program of this Conference can be carried out.

Facilities for Intensive Recreation Primarily a State and Local Problem.—The provision of facilities for intensive recreation presents a problem with relatively little regional significance. However, it is necessary to develop standards for these facilities, to eliminate harmful competition among them, and to determine the proportion of responsibility which public agencies should assume. Both public and commercial facilities are necessary to well-balanced development, but if they overlap or compete, there is both waste and inefficiency.

Access to Recreation Areas.—Construction of means of access to recreation areas is both an interstate and interregional problem. Although for the most part this depends on the solution of the New England transportation problem, certain phases may be considered as recreational. The construction of limited ways—of highways which add to the recreational advantages of the region—is of paramount importance.

Most recreation seekers travel by automobile. They demand safe, modern highways that provide ample opportunities for easy and pleasant access to scenic New England. Two factors that will increase driving pleasure are the regulation of wayside commercial development and the location of billboards, and the elimination of grade intersections. The need for roadside protection is now generally recognized and the adoption of freeway and highway zoning principles seems imminent.

Related Problems.—As has been pointed out, conservation and transportation are of utmost importance in the solution of New England's recreation problem. But there are other fields of activity which are closely related to recreational development. Three examples are:

(1) The provision of emergency airplane landing fields. In the aviation section of this report it is pointed out that aviation can aid recreation, as a means of access to areas. Also, recreation can aid aviation by providing the landing fields necessary for flying safety. In many places now lacking proper emergency landing facilities there are areas of public land suitable for such development. Cooperative effort between aviation officials and public land authorities could set apart appropriate fields, with no great loss to recreation.

(2) The construction of water detention reservoirs. The water resources section of this report indicates the need for storage reservoirs to regulate stream flow. Large storage reservoirs have almost no scenic or water sports value because of the extreme fluctuation of water levels, but small reservoirs may combine water conservation and recreation benefits, as has been demonstrated in many New England State forests. In either case the construction and regulation of reservoirs, and the acquisition and development of adjoining property call for close coordination of recreation and storage reservoir development.

(3) The use of submarginal lands for recreation. Farms and wood lots that no longer have agricultural value are liabilities to their owners and to society unless they can be developed for public or private recreational use. Such areas are often admirably suited to recreation and to wildlife conservation. The Iowa State Planning Board has advocated the dedication of much submarginal farm lands to wildlife restoration as a means of deriving "a more substantial income" than could be obtained through agriculture. If no recreational uses of such areas are apparent, careful reforestation might be effected with beneficial results to recreation and conservation.

Requirements for the Solution of Recreation Problems

There are two fundamental approaches to the solution of New England's recreational problems which have not been given sufficient recognition in the past. One of these is compilation of information on existing conditions; the other is coordinated effort in planning and development.

There is not, as yet, sufficient information available to permit a formulation of a program of recreational development, although fairly detailed data on some aspects of the situation have been compiled by the State planning boards, the New England Council, and private and commercial agencies. The staff of the Commission is compiling and will present to its recreation committee a preliminary survey of available recreation material. This report may serve as a basis for additional studies and for a tentative program of development. There is still a definite need for a comprehensive survey, such as has been outlined by the National Park Service, and such as is now being carried on to some extent, in connection with the writers' project of the Works Progress Administration.

There have been attempts to plan recreation on a coordinated interstate basis. Most of these have had private inspiration; some have been focused along commercial recreation only; but the New England Re-

gional Planning Commission is the first organization to attempt the comprehensive study and planning of recreation in the region as a whole. Through the Commission the State planning boards and recreation agencies may cooperate with National agencies and with private and commercial organizations in the development of a coordinated New England recreational program.

New England as a National Recreation Area

There is an additional factor involved in the study of recreation in New England—the promotion of New England as a national recreation area.

The New England Council has been effectively striving to advertise the recreational possibilities of the region. In 1935, through the cooperative action of the six New England Governors, a total of $100,000 was appropriated by the six States for the support of the Council's advertising program. State development commissions, State conservation agencies, chambers of commerce, and others have done much for the recreation industry in New England, yet their efforts have not been backed by the means, facilities, and information needed to carry on a program intensive enough to compare favorably with programs carried on in other recreation regions. Publicity is governed by financial support, but it is also governed by cooperative backing.

Conclusion

New England is admirably adapted to recreation purposes, and it offers unlimited possibilities to those seeking all types of recreation. A cooperating and coordinated New England can amply meet the recreation and vacation demands of its residents and it can also serve as a recreation center for people from other parts of the country. The revenue will go far to offset the losses suffered by the manufacturing and other declining industries. According to estimates, the recreation industry in 1917 was valued at $115,000,000,[1] this figure had increased to about $400,000,000[2] in 1935, tripling in less than two decades. Exact comparable figures are not available, but the value added by manufacturing decreased about 50 percent in the period, 1919–33. Recreation cannot take the place of manufacturing in industrial cities, but it has become the salvation of many rural areas and smaller cities. During this same period, the increase of leisure time has resulted in a more widespread participation in outdoor recreation. New England has in part provided for this participation by the development of many of her natural recreational advantages.

In order to realize to the fullest these natural possibilities, New England must embark upon a coordinated program for—

1. Establishment of a balance between public and private recreational activities;
2. The protection of natural advantages;
3. The development of adequate facilities of all types;
4. The provision of safe, convenient, attractive means of access to recreational areas; and
5. The organized publicity of recreational assets.

In working out this program, special consideration should be given to those types of recreational opportunity which are peculiar to New England. Historic background, architectural individuality, and village charm may not have so universal an appeal as lakes, mountains, forests, and seashore; but they do have a quality of appeal that cannot be duplicated elsewhere. Although natural advantages constitute the general basis for recreational development, those cultural qualities which can be found only in New England must be preserved and enhanced if New England is to make the most of its recreational opportunities.

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[1] L. W. Chidester, Tourism in New England, unpublished.
[2] New England Council, New England Today.

STAFF REPORT—SECTION IV
WATER RESOURCES

Introduction

The conservation and utilization of New England water resources, the better to benefit the region as a whole, can be secured only through the adoption of a public policy of coordination and cooperation in which the interrelation of the important economic and social problems of the adjoining States containing interstate streams are fully recognized.

The water resources of New England have been an important factor in the successful development of many of its economic enterprises. The textile and paper industries started here and grew as a result of plentiful cheap power and an abundant supply of suitable water; agriculture has thrived largely because of fertile river valleys and adequate uniform rainfall; the forest industries have owed much of their prosperity to the inexpensive log drives on the rivers; recreational activities have been promoted by the many lakes and streams; fishing industry and commerce have depended on natural harbors advantageously located.

The natural advantages of New England water resources have been increased in many ways. Harnessing the potential energy of the rivers has provided industrial and electric power; damming river valleys has permitted storage for water supply and for the regulation of river flow, the latter use increasing the power of the streams and assisting in their purification; deepening river channels has opened up many inland communities to water-borne commerce; raising natural ponds and lakes has added to recreational assets.

By contrast, much has been done to depreciate the water resources of New England. Indiscriminate and excessive denuding of forest lands has diminished their usefulness as aids to natural purification of water supplies and to regulation of stream flow; stripping of land cover has caused soil erosion, which has resulted in the spoliation of agricultural lands and the deposition of silt in reservoirs and in rivers; discharging domestic sewage and industrial wastes directly into the rivers has heavily polluted many of them, resulting in unhealthful and unsightly conditions along their courses.

In connection with this last item, there are many cases where these polluted conditions extend beyond the confines of the rivers themselves into the waters at their mouths. Water thus impaired is rendered unfit for the cultivation of shellfish. How to lessen stream pollution in New England is one of the urgent problems connected with water resources.

Water Resources Committee

In 1935 the Commission appointed a water resources committee to study water conditions. The results, together with recommendations, are to be made available to groups interested in the water problems of New England.

The first act of the committee was to draw up a broad outline for river basin investigations covering the collection of basic data as well as the study of stream uses and river basin improvements.

The committee have examined and classified public works projects relating to water resources by way of cooperating with the P. W. A. State engineers; they have recommended a modified form of the bill, submitted by Representative William M. Citron, of Connecticut, providing for Federal enabling legislation to permit the forming of interstate compacts; they have drawn up forms for interstate compacts for the development of water resources in the Connecticut, Merrimack, and Blackstone River Basins; they have drafted a plan of procedure for conducting investigations in the Connecticut River Valley.

The Commission has prepared a bibliography of interstate water resources information, and has made it available to the State health engineers and others.

There are in New England 19 principal river systems (excluding coastal streams), as shown in figure 54, 9 of which flow through more than 1 State. Of these interstate streams the Commission considers three to be of major interstate significance—the Connecticut, Merrimack, and Blackstone Rivers. The staff of the commission has made preliminary studies and reports on existing conditions and problems in these river valleys, has submitted them to the water resources committee of the Commission. There follows a brief summary of the data on these streams as assembled by the Commission.

Connecticut River

General.—The Connecticut River Valley, extending into four States, covers the greatest area and has the largest population of any drainage area in New England. Also, there is more water power, both developed

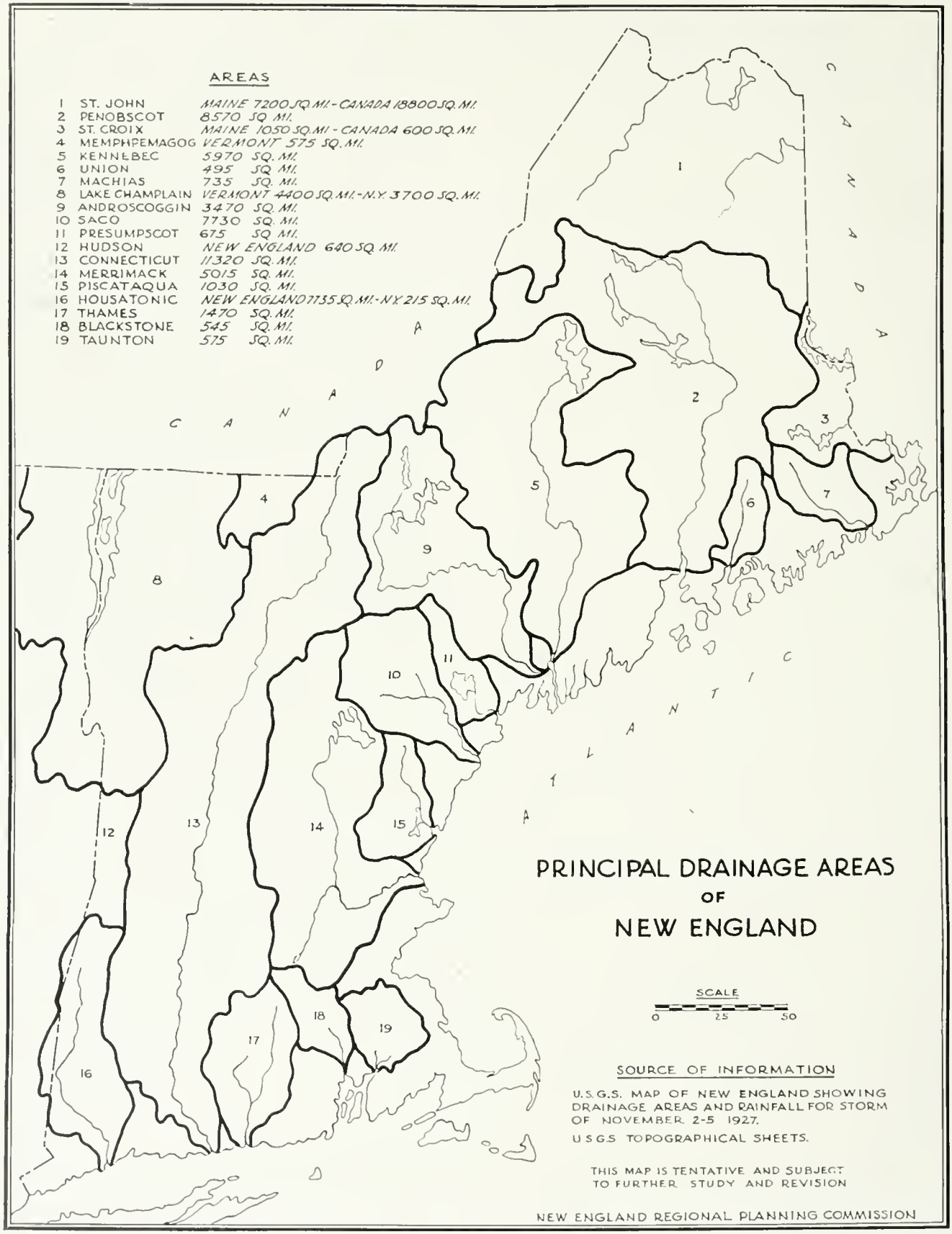

AREAS
1 ST. JOHN MAINE 7200 SQ MI - CANADA 18800 SQ MI.
2 PENOBSCOT 8570 SQ MI.
3 ST. CROIX MAINE 1050 SQ MI - CANADA 600 SQ MI.
4 MEMPHREMAGOG VERMONT 575 SQ MI.
5 KENNEBEC 5970 SQ MI.
6 UNION 495 SQ MI.
7 MACHIAS 735 SQ MI.
8 LAKE CHAMPLAIN VERMONT 4400 SQ MI - N.Y. 3700 SQ MI.
9 ANDROSCOGGIN 3470 SQ MI.
10 SACO 7730 SQ MI.
11 PRESUMPSCOT 675 SQ MI.
12 HUDSON NEW ENGLAND 640 SQ MI.
13 CONNECTICUT 11320 SQ MI.
14 MERRIMACK 5015 SQ MI.
15 PISCATAQUA 1030 SQ MI.
16 HOUSATONIC NEW ENGLAND 1135 SQ MI - N.Y. 215 SQ MI.
17 THAMES 1470 SQ MI.
18 BLACKSTONE 545 SQ MI.
19 TAUNTON 575 SQ MI.
CANADA
ATLANTIC
PRINCIPAL DRAINAGE AREAS
OF
NEW ENGLAND
SCALE
0 25 50
SOURCE OF INFORMATION
U.S.G.S. MAP OF NEW ENGLAND SHOWING DRAINAGE AREAS AND RAINFALL FOR STORM OF NOVEMBER 2-5 1927.
U S G S TOPOGRAPHICAL SHEETS.
THIS MAP IS TENTATIVE AND SUBJECT TO FURTHER STUDY AND REVISION
NEW ENGLAND REGIONAL PLANNING COMMISSION

FIGURE 51

and undeveloped, on the Connecticut River than on any other two rivers in New England.

The Connecticut drainage area comprising about 11,320 square miles, of which 115 square miles are in Canada, is equal to twice the combined area of Rhode Island and Connecticut, or more than one-third of New England, exclusive of Maine. The population (about 1,230,000) represents 15 percent of the total in New England. Located in the valley are all, or parts, of 355 towns and cities, including 20 with a population over 10,000. The value of its 4 million or more acres of farms and their buildings is nearly 200 million dollars; the value of its manufactured products is estimated at a billion dollars yearly.

Water Supply.—There are 147 municipalities having public water-supply systems, most of which are supplied by surface waters; the rest depend upon underground sources. In addition, a large area of this watershed is being developed as a water supply for the Boston metropolitan water district. Many of the systems include treatment plants; others rely for purification upon storage or natural watershed protection. The water-supply problem is interstate in scope inasmuch as the taking of water from a river or its tributaries alters the flow and affects, in varying degrees, power and industrial plants below the point of diversion.

The distribution of water-supply systems and their classification according to types of sources is shown in figure 56. Of the towns in the watershed that have over 1,000 inhabitants, there are 24 which do not have public water-supply systems.

Photo by Harry L. Plummer *Courtesy of Maine Development Commission*

FIGURE 55. The potentialities of hydro-electric power sites in New England are typified by the Gulf Island development on the Androscoggin River.

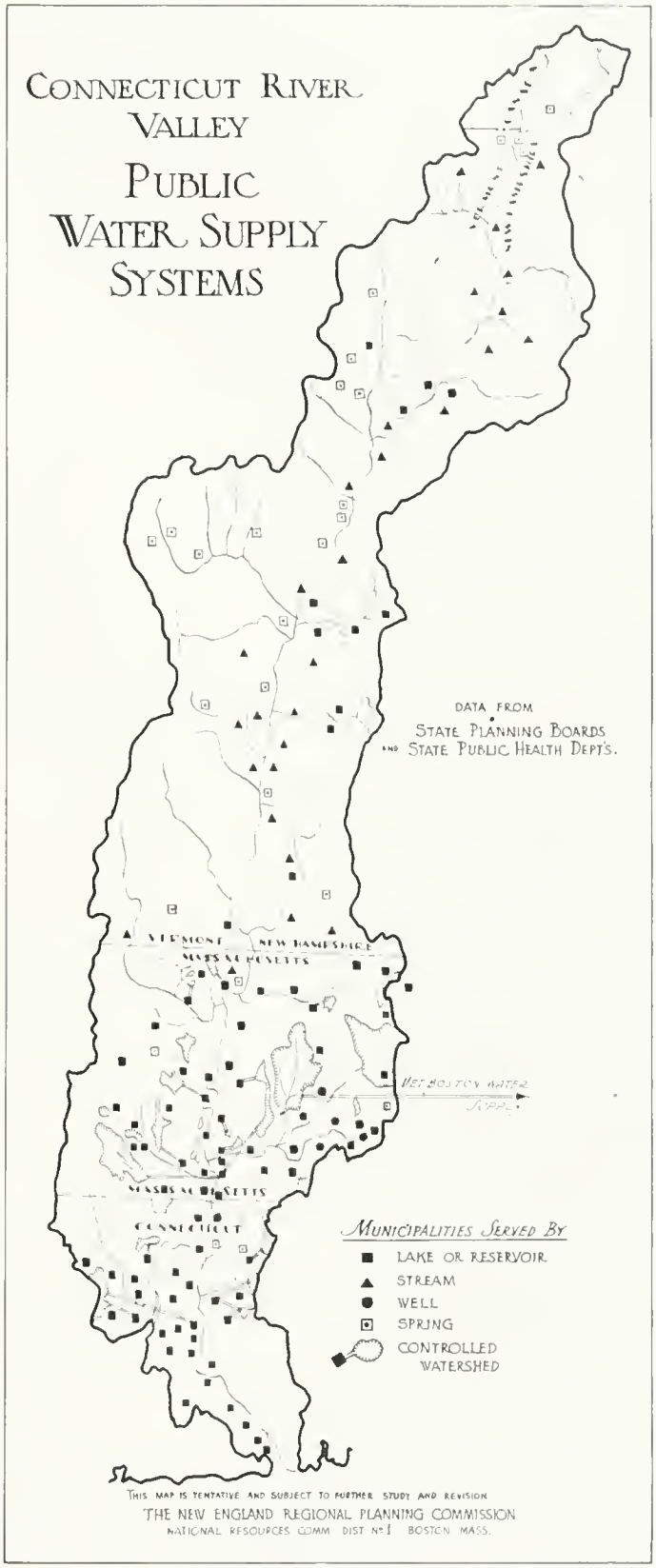


FIGURE 56

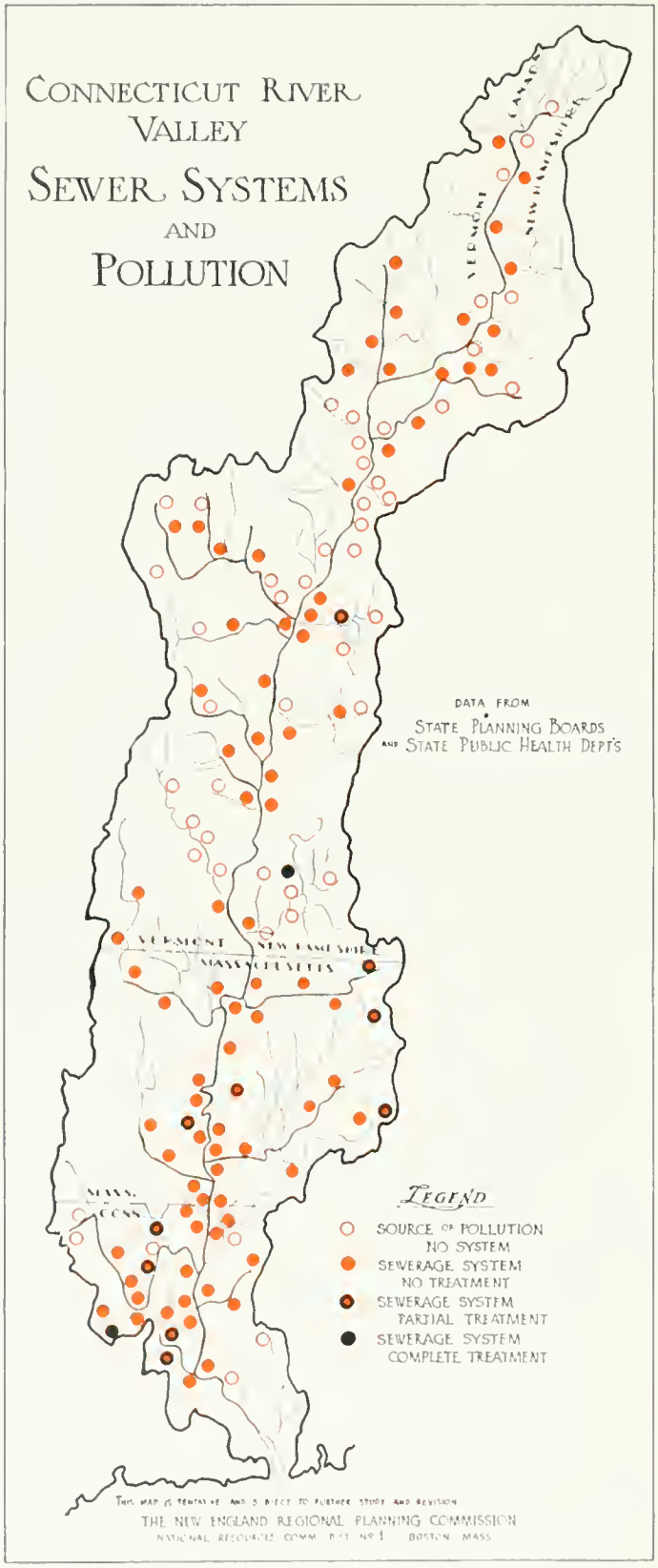


FIGURE 57

Stream Pollution.—The disposal of sewage and industrial wastes is an urgent problem because the discharge of these wastes in both the main river and its tributaries vitiates industrial and domestic water supplies, destroys fish and other water life, and precludes the recreational use of the river. The sources of pollution on the river and its tributaries are shown in figure 57.

Of the 97 public sewerage systems in the valley serving 10 or more families, with an estimated population thus served of 835,000, or about 70 percent of the total, 82 discharge raw sewage directly into the main river; the sewage from 13 other systems reaches the river after receiving partial treatment; and 2 systems include complete treatment.

A general study of pollution conditions of the Connecticut River in Massachusetts was made in 1934 by the Springfield City Planning Board in cooperation with the New England Regional Planning Commission. A similar study of all the streams of that State has recently been made by the State Planning Board of Connecticut. To complete available data concerning this source of pollution there is need for a further survey with reference to the industrial wastes discharged into the river.

The State of Connecticut has a well-established policy regarding pollution of the river. At present the large communities which have, in the past, discharged sewage into the stream, are, with one exception, now building sewage treatment plants. By contrast, in Massachusetts the large cities are still discharging raw sewage into the stream.

Stream Flow.—The stream flow of the Connecticut Valley is obtained at 46 gaging stations, 10 of which are on the main river, and the remainder on 16 of its major tributaries. More than half of these stations have records of 10 or more years and show an average rate of run-off of 1.67 cubic feet per second per square mile. The records show the run-off to vary from nothing on many of the smaller streams during dry periods to a maximum 24-hour rate of 60 cubic feet per second per square mile. This occurred on the south branch of the Ashuelot River during the flood of 1927.

The wide variation between low and flood flows results in economic losses which can be lessened and, in some cases, prevented, by the construction of storage reservoirs or basins. Such reservoirs would make possible the regulation of the river during dry seasons and the reduction of the peak flow of the river during floods.

Storage and Power Developments.—Existing power storage reservoirs, including Connecticut Lakes, Fifteen Mile Falls lower development, Sunapee, and other smaller lakes, and the Harriman and Somerset

Reservoirs on Deerfield River have a total capacity of about 14 billion cubic feet.

State authorities in Vermont, New Hampshire, and Massachusetts, the Army engineers, and the New England Power Co. have made investigations of power-storage reservoir sites in the Connecticut Basin, comprising potential storage capacity of about 75 billion cubic feet. It would be expensive to develop many of these sites, however, and a thorough study is desirable to coordinate the available data and work out a comprehensive plan of storage development and the resulting possible flow regulation for the basin as a whole, and to map out a program for the same.

The commission has information on 295 existing water-power developments in the Connecticut River Valley with a total installed capacity of approximately 677,000 horsepower, and a total head of about 7,000 feet. Of these, 40 have installed capacities of over 1,000 horsepower.

There are 121 new power developments suggested by various State and other agencies, either as redevelopments of existing sites or developments of new privileges. These plants would represent a total installed capacity of about 725,000 horsepower, and would increase the total developed head in the river valley by about 12,000 feet. The indicated capacity and the economic feasibility of many of these developments depend upon the construction of storage reservoirs, and here again, a coordinated plan for their development is needed to harmonize properly the various private and public interests involved. In most cases, the downstream plants are distributed among four different States, and are owned by different private or public utility companies. Probably the most successfully developed river in New England is the Deerfield, where, with one exception, all the power privileges are owned by the same company. Thus, the problem of control of storage and power is greatly simplified.

Navigation.—At present navigation on the Connecticut is limited to 52 miles of tidal river where the Army engineers maintain a channel 300 feet wide and 15 feet deep across the bar at the mouth, and thence 100 feet wide and 12 feet deep to Hartford. The Army engineers have recommended further improvement to provide a channel 300 feet wide and 15 feet deep from the mouth to Lyme railroad bridge, and thence 150 feet wide and 15 feet deep to Hartford. The average traffic on the river below Hartford for the last 5 years has been about 645,000 tons annually, and the estimated traffic by 1942 is 900,000 tons, if the above improvement is made.

A further project has been authorized by the River and Harbor Act of July 3, 1930. This provides for a channel 100 feet wide and 12 feet deep from Hartford

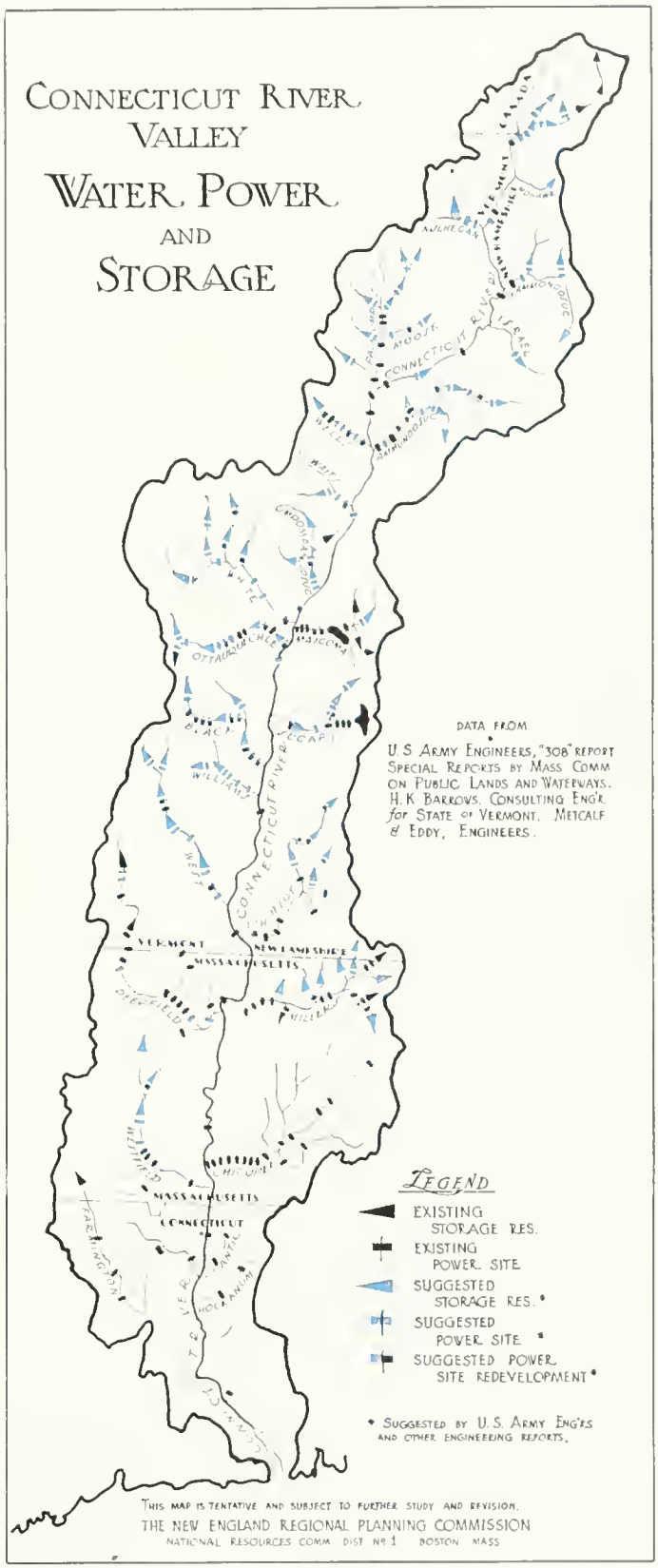

CONNECTICUT RIVER VALLEY
WATER POWER AND STORAGE
DATA FROM
U.S. ARMY ENGINEERS, "308" REPORT
SPECIAL REPORTS BY MASS. COMM. ON PUBLIC LANDS AND WATERWAYS.
H.K. BARROWS, CONSULTING ENG'R. for STATE OF VERMONT. METCALF & EDDY, ENGINEERS.
LEGEND
EXISTING STORAGE RES.
EXISTING POWER SITE
SUGGESTED STORAGE RES.*
SUGGESTED POWER SITE *
SUGGESTED POWER SITE REDEVELOPMENT*
* SUGGESTED BY U.S. ARMY ENG'RS AND OTHER ENGINEERING REPORTS.
VERMONT
NEW HAMPSHIRE
MASSACHUSETTS
CONNECTICUT
CONNECTICUT RIVER
THIS MAP IS TENTATIVE AND SUBJECT TO FURTHER STUDY AND REVISION.
THE NEW ENGLAND REGIONAL PLANNING COMMISSION
NATIONAL RESOURCES COMM. DIST. No. 1 BOSTON, MASS.

FIGURE 58

to Holyoke, Mass., a distance of 32 miles. The execution of this project is contingent upon the construction of a dam and short lock at Enfield Rapids by local public or private interests under license issued by the Federal Power Commission.

A hearing on this project, now at a standstill because of the cancelation of the license in September 1934, is to be held before the Army engineers early in February, with a view to determining whether the project should be modified.

Merrimack River

General.—While the drainage area of the Merrimack River, of about 5,000 square miles, is slightly less than half that of the Connecticut, the greater density of its population, especially in the lower half of the watershed, intensifies its problems.

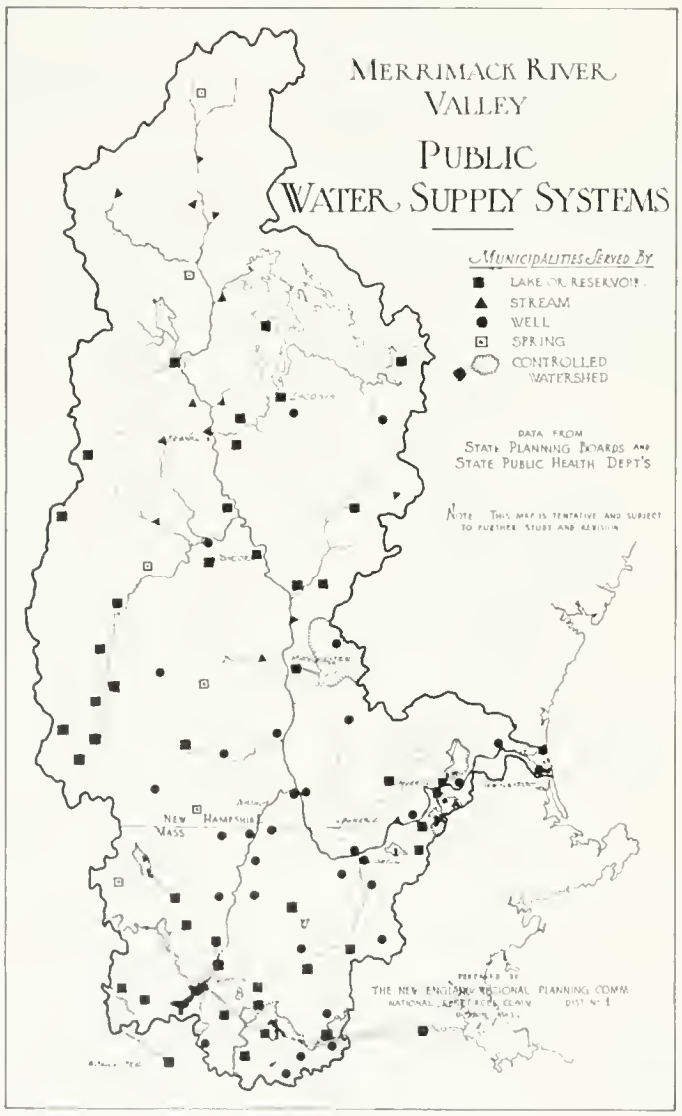

MERRIMACK RIVER VALLEY
PUBLIC WATER SUPPLY SYSTEMS
MUNICIPALITIES SERVED BY
LAKE OR RESERVOIR
STREAM
WELL
SPRING
CONTROLLED WATERSHED
DATA FROM STATE PLANNING BOARDS AND STATE PUBLIC HEALTH DEPT'S
NOTE - THIS MAP IS TENTATIVE AND SUBJECT TO FURTHER STUDY AND REVISION
NEW HAMPSHIRE
MASS
PREPARED BY THE NEW ENGLAND REGIONAL PLANNING COMM

FIGURE 59

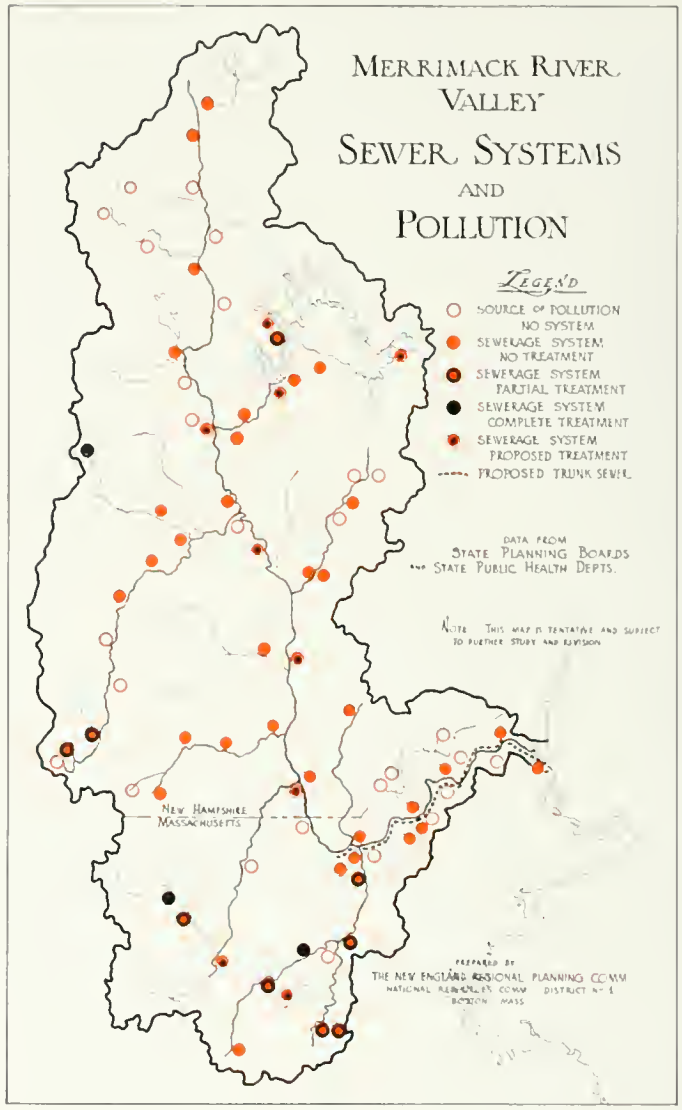

MERRIMACK RIVER VALLEY
SEWER SYSTEMS AND POLLUTION
LEGEND
SOURCE OF POLLUTION NO SYSTEM
SEWERAGE SYSTEM NO TREATMENT
SEWERAGE SYSTEM PARTIAL TREATMENT
SEWERAGE SYSTEM COMPLETE TREATMENT
SEWERAGE SYSTEM PROPOSED TREATMENT
PROPOSED TRUNK SEWER
DATA FROM STATE PLANNING BOARDS AND STATE PUBLIC HEALTH DEPTS.
NOTE - THIS MAP IS TENTATIVE AND SUBJECT TO FURTHER STUDY AND REVISION
NEW HAMPSHIRE
MASSACHUSETTS
PREPARED BY THE NEW ENGLAND REGIONAL PLANNING COMM

FIGURE 60

Nearly 70 percent of the people in the Merrimack Valley (about 811,000) are in the 16 cities of over 10,000. These cities contain over 1,400 manufacturing establishments, with a total value of products, in 1933, of nearly 300 million dollars.

Water supply.—The Merrimack River drainage area is the largest source of public water supply in New England, supplying nearly $2\frac{1}{2}$ million people living in 208 communities located both within and beyond the boundary of the drainage basin. The quantity of water supplied amounts to nearly 70 billion gallons a year—equivalent to the run-off from about 100 square miles of drainage area.

One hundred and nineteen of these municipalities are located in the drainage basin: 80 receive their water from surface waters, 30 from ground water, and 9 from both sources. They are supplied by 106 public sys-

tems, shown in figure 59, 37 of which include treatment.

Stream Pollution.—The problem of freeing the Merrimack Valley from pollution by sewage and industrial wastes is of considerable importance. Ten cities, including 7 with a population of 10,000 and over, discharge untreated sewage directly into the river. Six of these cities are situated upstream from Lawrence, which obtains its domestic water supply directly from the river, filtration and chlorination being employed to render the water safe. Other streams which receive a great quantity of untreated sewage are the Winnepesaukee, Contoocook, Nashua, Concord, and Shawsheen Rivers. The sources of pollution in the Merrimack Valley are shown in figure 60.

Stream Flow.—The stream flow of the Merrimack River and its tributaries is obtained at 20 stations, 14 of which have records of 10 or more years. The average annual run-off for these 14 stations is 1.53 cubic feet per second per square mile. Although the flow has been practically nothing on several of the smaller streams during dry periods, it reached a maximum 24-hour average of 65 cubic feet per second per square mile on the Pemigewasset River during the 1927 flood.

Flood damage in the Merrimack Basin occurs chiefly on the Pemigewasset Branch and on the main river below its junction with the Winnepesaukee River. The latter has a fairly well-regulated flow due to the storage capacity in Winnepesaukee and Squam Lakes. The regulation of stream flow, both for low- and high-water conditions, is urgently needed on the Merrimack.

Storage and Power Developments.—The present storage in the Merrimack River Basin amounts to slightly over 13 billion cubic feet—12 billion being in New Hampshire. Five additional reservoirs comprising about 18 billion cubic feet have been suggested by the State of New Hampshire and by the Army engineers.

The total developed power is nearly 220,000 horsepower, under an aggregate head of slightly over 6,200 feet. More than half of this power is on the main river, with about 90,000 horsepower being developed at Manchester, Lowell, and Lawrence. Three new power sites, having a developed capacity of 47,000 horsepower, under a head of about 350 feet, have been suggested in conjunction with the reservoirs mentioned above.

Navigation.—The Merrimack River is navigable only in its lower tidal portion. The Army engineers maintain a channel 7 feet deep and 150 feet wide from Newburyport to Haverhill, a distance of 17 miles. The average annual traffic to Haverhill is about 20,000 tons, only one-third of that which enters the mouth of the river. The Army engineers made a survey with a view to extending the head of navigation to Lowell, about 18 miles from Haverhill, but they reported unfavorably on the project.

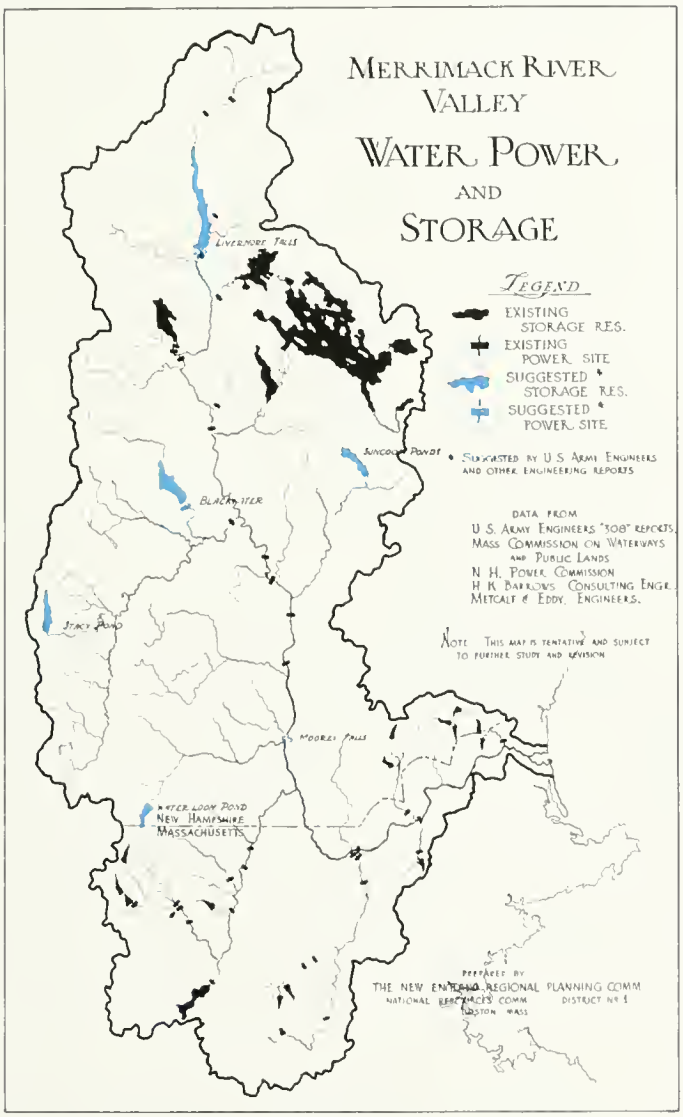


FIGURE 61

Blackstone River

General.—The Blackstone River Valley, with a drainage area of approximately 545 square miles, has less than one-twentieth the area of the Connecticut Valley, yet it has nearly one-third as great a population. It is the most densely populated watershed in New England, with more than 1,000 people per square mile, and is also highly industrialized. There are, in proportion to its area, so many water-power developments on the Blackstone that its problems are highly significant to both Massachusetts and Rhode Island.

Water Supply.—There are 22 cities located within the watershed which have public water systems. Of these, more than half are supplied by wells, the remainder by surface waters. There are few sites available for new water-supply reservoirs, and any considerable extension of water systems would require the utilization of underground sources.

Stream Pollution.—Both industrial and domestic wastes are discharged into the river in such volumes that it is polluted throughout its entire course. Of the eight sewerage systems which outfall into the river, the larger ones treat the sewage before it is discharged, but the only system which includes complete treatment is that of Worcester.

The Rhode Island metropolitan sewer commission has prepared plans for a sewage-disposal system and treatment plant which would serve all the Rhode Island communities in the Blackstone Valley except those on the upper Branch River, and would dispose of the sewage from over 200,000 of the population.

The accompanying map shows the known sources of pollution on the Blackstone River.

Stream Flow.—There are two gaging stations on the Blackstone River, one at Worcester, Mass., established in 1923, serving a drainage area of 31.5 square miles, and a second at Woonsocket, R. I., established in 1929, serving a drainage area of 415 square miles. The records at the Worcester station show a mean annual

LEGEND
SOURCE OF POLLUTION NO SYSTEM
SYSTEM WITH NO TREATMENT
SYSTEM WITH PARTIAL TREATMENT
SYSTEM WITH COMPLETE TREATMENT
PREPARED BY NEW ENGLAND REGIONAL PLANNING COMM. NATIONAL RESOURCES COMM. DIST. No. 1 BOSTON, MASS.
MASS.
CONN.
R. I.
BLACKSTONE R. WEST
MILLFORD
BRANCH R.
BLACKSTONE R.
TEN MILE R.
DATA FROM STATE PLANNING BOARDS & PUBLIC HEALTH DEPARTMENTS
BLACKSTONE RIVER VALLEY
SEWER SYSTEMS AND POLLUTION
THIS MAP IS TENTATIVE AND SUBJECT TO FURTHER STUDY AND REVISION

FIGURE 63

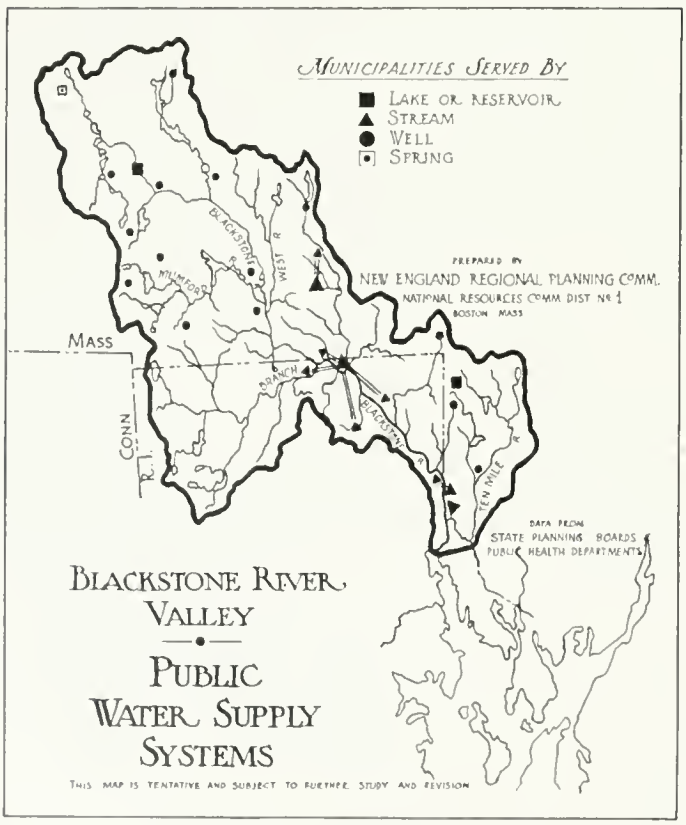


FIGURE 62

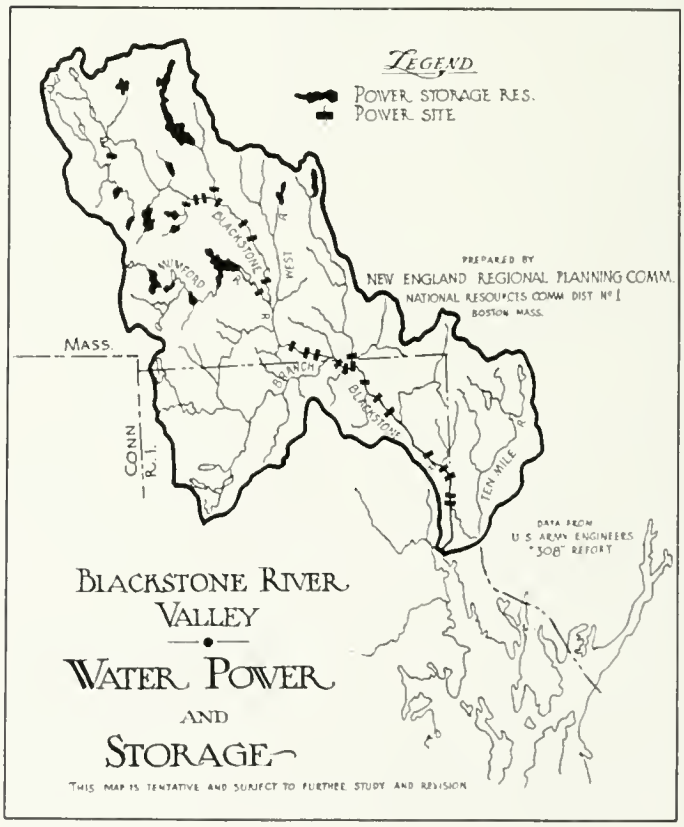


FIGURE 64

run-off of 1.54 cubic feet per second per square mile, with a recorded minimum flow of 0.3 cubic feet per second and a maximum of 935 cubic feet per second. At Woonsocket, the mean annual run-off during the years of record is 1.51 cubic feet per second per square mile, the minimum being 7 cubic feet per second and the maximum 9,760 cubic feet per second. At the time of the 1927 flood, the estimated peak discharge at Woonsocket was about 14,500 cubic feet per second.

During the dry season, because of the low flow above the Worcester sewage disposal works, the volume of water is approximately the same as that of the treated sewage discharged into the river from these works. The dilution afforded by this treated sewage has actually assisted in solving the pollution problem of the river.

The problem of floods on the Blackstone is not serious. Floods have not produced excessive losses either of property or life and, generally speaking, the property damages have been confined to the industrial plants along the river banks.

Storage and Power Developments.—Available storage totals about 1 billion cubic feet, and there are possibilities for increasing that amount to a limited extent. Although additional storage may not be of great importance in connection with flood control, it would help to improve conditions by increasing the stream flow during dry periods.

The Blackstone has a reputation as one of the most highly developed streams in the world. Most of the water-power privileges which have been developed are still in use. At present, the total installed capacity of the developments on the main river and its tributaries, shown in figure 64, amounts to approximately 20,000 horsepower, with a total head of nearly 1,000 feet.

Navigation.—Navigation in the Blackstone Valley is limited to the tidal stretch below the first dam in Pawtucket, usually known as the Seekonk River. The Army engineers maintain a channel 16 to 18 feet deep and 150 to 230 feet wide in this 5-mile section of the river. The Army engineers have approved no extension of navigation above Pawtucket, but have recommended further improvement of the present navigable section below Pawtucket when commerce shall require more width and depth than the present channel affords. Early in February the board of Army engineers is to hear proposals for dredging the channel to a 25-foot depth and for removing Bold Point and a part of India Point.

Other Interstate Streams

Although the problems of water supply, pollution, power, and flood control assume their greatest importance on the three major interstate streams, these problems are present on all streams and must be considered in planning for the conservation and development of New England water resources.

The Commission confines its studies to interstate streams, except where the development of the resources of an intrastate stream involves the interests of adjoining States. Otherwise the Commission considers planning for intrastate streams to be under the jurisdiction of the State planning boards.

In general the streams in southern New England offer problems concerned mainly with water supply and pollution while the streams in Vermont and New Hampshire and, to a lesser extent, in Maine, present problems of power and flood control.

The rivers in Vermont which are tributary to Lake Champlain present acute flood problems owing to the lack of storage and the steep and partly denuded slopes of the Green Mountains. After making exhaustive engineering studies of these conditions, the advisory committee of engineers on flood control for Vermont, in 1928–30, suggested many sites for the location of storage reservoirs. Of the reservoirs recommended, three have already been constructed on the Winooski River at East Barre, Waterbury, and Wrightsville by the Civilian Conservation Corps. The State of New Hampshire has carried out similar studies and made plans covering the more important rivers of that State.

Reforestation

A factor of the conservation of water resources is the condition of forest cover. Congress, in 1911, passed the Weeks Purchase Act "to enable any State to cooperate with any other State or States or with the United States for the protection of the watersheds of navigable streams and to appoint a commission for the acquisition of lands for the purpose of conserving the navigability of navigable rivers." The White Mountain National Forest in New Hampshire and the Green Mountain National Forest in Vermont have been established in accordance with the provisions of this act.

Although the creation of these national-forest reserves was for the purpose of aiding navigable streams, there are several other benefits to be derived from them. Forests are effective in reducing flood flows of streams, in protecting the soil of the mountain slopes from erosion, and in permitting the seepage of water into the soil to augment the underground reservoir which feeds the river during the dry season.

Consequently, protection of existing forest areas and reforestation of denuded areas are matters which should be included in a program of river valley conservation.

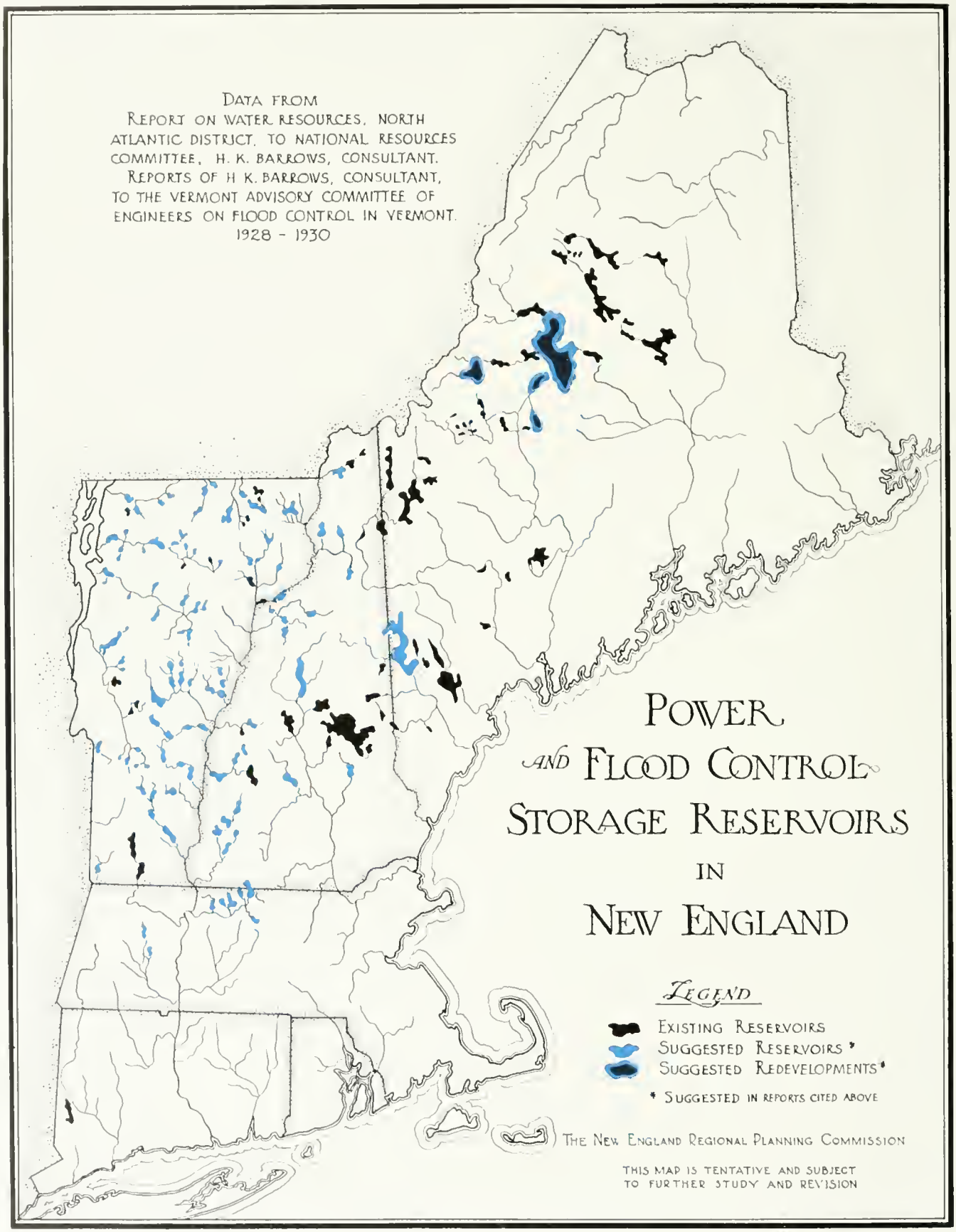

DATA FROM
REPORT ON WATER RESOURCES, NORTH ATLANTIC DISTRICT, TO NATIONAL RESOURCES COMMITTEE, H. K. BARROWS, CONSULTANT.
REPORTS OF H K. BARROWS, CONSULTANT, TO THE VERMONT ADVISORY COMMITTEE OF ENGINEERS ON FLOOD CONTROL IN VERMONT.
1928 - 1930
POWER AND FLOOD CONTROL STORAGE RESERVOIRS IN NEW ENGLAND
LEGEND
EXISTING RESERVOIRS
SUGGESTED RESERVOIRS *
SUGGESTED REDEVELOPMENTS *
* SUGGESTED IN REPORTS CITED ABOVE
THE NEW ENGLAND REGIONAL PLANNING COMMISSION
THIS MAP IS TENTATIVE AND SUBJECT TO FURTHER STUDY AND REVISION

FIGURE 65

Recreational Aspects

The adaptability of rivers and lakes in New England for recreational purposes is so ideal that in many extensive areas of the region the providing of recreational facilities has become a major industry. Ample opportunity for the enjoyment of water sports has been furnished by the large number of natural lakes and ponds, making unnecessary the use of water supply reservoirs for recreational purposes.

The polluted condition of many rivers has precluded their use for bathing. Future abatement of these conditions will automatically lead to opening marginal areas along these rivers to recreational uses.

Interstate Cooperation

As has been stated, most of the problems mentioned above, especially concerning the Connecticut, Merrimack, and Blackstone Valleys, require interstate cooperation to an extensive degree. Yet, at present, no two adjoining States have the power to enter into contractual agreements dealing with the development of interstate streams. Although there has been agitation for coordination and cooperation in solving interstate problems in the past few years, inability to carry out projects as distinctly cooperative ventures has been a strong deterrent to the comprehensive development of New England water resources.

Interstate Compact Legislation

One of the first activities of the water resources committee of the Commission was to study the possibilities of cooperative interstate development of water resources. The alternative means of securing such cooperative development seemed to be either through setting up river-valley districts, or enacting interstate compacts. The first would involve the establishment by Congress of definite authorities; the second would require State enabling legislation and Federal approval, together with the sanction of individual compacts by the legislatures of the States concerned. The water resources committee reported on this problem as follows:

A thorough discussion was made of methods for carrying out investigations and the formulation of plans for river improvements, and the committee unanimously presents the following suggestions and recommendations:

1. The investigation, planning, and development of river basins should be comprehensive and deal with the river and its tributaries as a whole.

2. On intrastate streams, such procedure may be under State control and presents no serious obstacles in respect to authority.

3. On interstate streams, agreements or compacts between the various States included by a river basin are essential to enable treatment of the basin as a whole and to make it possible to comprehensively investigate and develop its water resources. This may require some enabling Federal as well as State legislative action as a basis for bringing the States together and procedure by the various States in making such compacts with each other.

4. The provisions of H. R. 6233 for the Merrimack Valley Authority and a similar bill, H. R. 4979, for the Connecticut Valley Authority, now before Congress, are completely at variance with the method of State control of river basins previously suggested, and in fact would place that power in a commission appointed by the President and under Federal control.

5. Such Federal legislation, if enacted, would place large portions of New England under Federal control, and in a State like New Hampshire this would mean more than three-quarters of the State area thus segregated.

6. The committee is therefore of the opinion that in place of the bills H. R. 6233 and H. R. 4979 should be substituted enabling bills in form acceptable to the States involved and which will provide for and encourage the adoption of interstate compacts as a basis for the investigation and development of water resources by the various States.

The Federal interstate compact enabling bill proposed by the water resources committee of the commission is quoted below, as are the acts passed by the legislatures of New Hampshire and Connecticut in the 1935 session. The Commission has voted to study the matter of interstate compacts and cooperation with a view to recommending preferred forms and methods thereof.

* * * * * * *

Federal enabling bill for interstate compacts in New England, suggested form, August 14, 1935. (Suggested by the water resources committee of the New England Regional Planning Commission):

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled: That the consent of the Congress of the United States is hereby given to the States of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut, or any two or more of them to enter into agreements or compacts for conserving and regulating the flow, lessening flood damage, removing or controlling pollution, or making other public improvements on any rivers or streams whose drainage basins lie within any two or more of the said States.

* * * * * * *

Special acts of the general assembly of the State of Connecticut, January session, 1935. (Senate Bill No. 772 (527).)

AN ACT CONCERNING THE APPOINTMENT OF A COMMISSION TO ACT JOINTLY WITH SIMILAR COMMISSIONS OF MAINE, NEW HAMPSHIRE, VERMONT, MASSACHUSETTS, AND RHODE ISLAND IN FORMULATING A TREATY FOR THE DEVELOPMENT AND PROTECTION OF WATERWAYS COMMON TO ANY TWO OR MORE OF SAID STATES:

Be it enacted by the Senate and House of Representatives in General Assembly convened:

SECTION 1. The Governor is authorized to appoint a commission composed of the attorney general, or his representative, and such other person or persons as he may deem advisable, to meet with the commissioners appointed, or who may be appointed under or by virtue of the laws of the legislature of the States of Maine, New Hampshire, Vermont, Massachusetts, and Rhode Island, and to negotiate and agree upon the terms of a treaty or treaties among the said States, or any

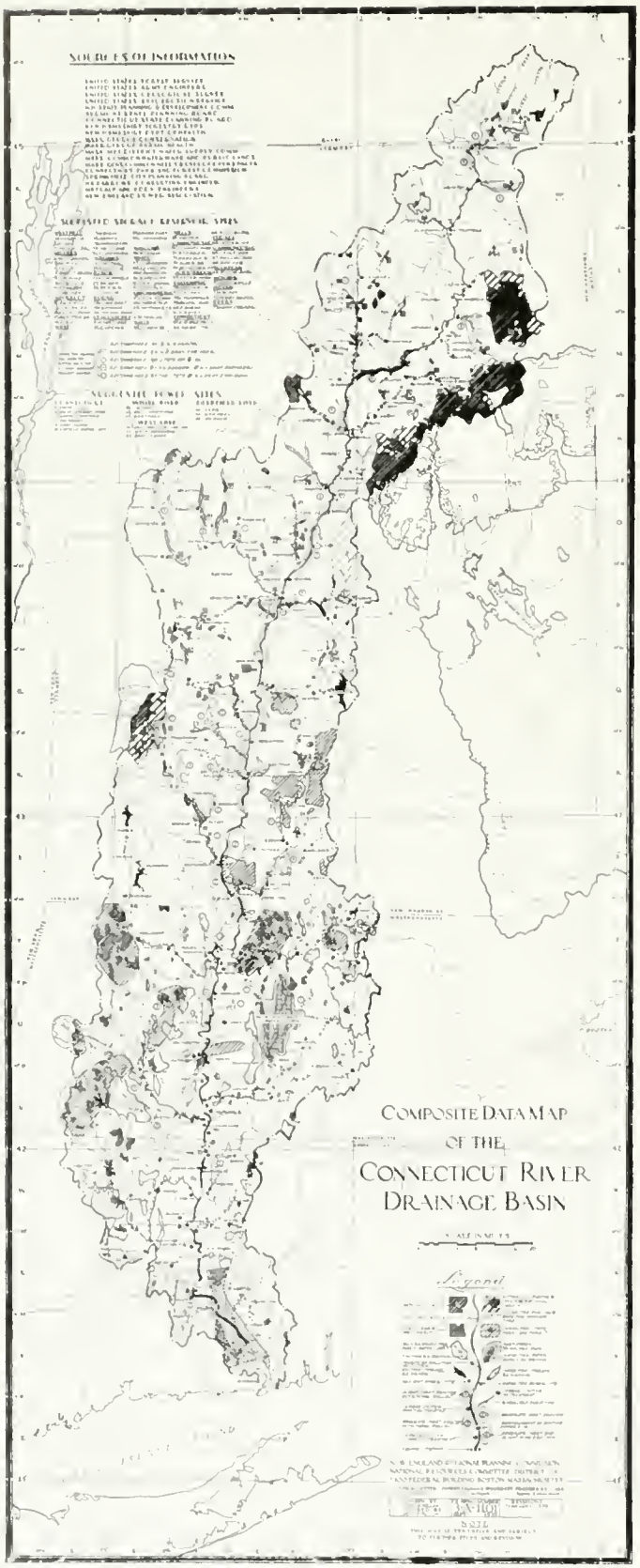


FIGURE 66

of them, and the Government of the United States, such treaty or treaties to cover comprehensively all matters relating to the development and improvement, including elimination of pollution, and the carrying out of Public Works projects on the banks and areas adjacent thereto, of the natural waterways flowing through or situated between any of the said States and the State of Connecticut, and of the natural waterways of said States and the State of Connecticut flowing respectively thereto.

SEC. 2. Such commission shall report the terms of such treaty or treaties as may be agreed upon to the general assembly, and in such report shall recommend such legislation, both State and Federal, as may be necessary to render such treaty or treaties effective. The members of such commission shall serve without compensation.

Approved June 21, 1935.

* * * * * * *

EXCERPT FROM AN ACT TO ESTABLISH THE NEW HAMPSHIRE WATER RESOURCES BOARD (APPROVED JUNE 19, 1935):

SEC. 21. *Interstate compacts.* The Governor, with the advice and consent of the council, is hereby authorized and empowered in the name and on behalf of the State of New Hampshire to enter into agreements or compacts with any one or more of the other States commonly known as the New England States as they may deem for the best interests of this State and the inhabitants thereof for the purpose of promoting health, welfare, and public safety by conserving and regulating the flow and diversion, lessening flood damage, and removing or preventing sources of pollution of the waters of any rivers or streams whose drainage basins or any portion thereof lie within this State, and by agreeing with such States as to their respective rights in the water of such rivers or streams; provided the consent of the Congress of the United States has been or shall be given to the making of such agreements or compacts.

Conclusion

Before the Commission made its studies of the Connecticut, Merrimack, and Blackstone Valleys, the Army engineers were practically the only agency to treat the interstate streams as geographical units. The "308" reports submitted to Congress by the Secretary of War were almost the only comprehensive studies of water resources of the major New England streams. However, the recommendations in these reports dealt only with flood control and navigation problems, and included only those potential developments of an interstate nature which the Army engineers considered of sufficient importance to be carried out by the Federal Government.

Another Federal agency which has studied the water-resources problems from the point of view of drainage basins is the Geological Survey. They have obtained and compiled records of stream flow at 123 gaging stations on most of the large rivers of New England. Because there are not enough properly located stations, it is not yet possible to secure sufficiently comprehensive information.

The Commission realizes the need of a study of these interstate streams which will be comprehensive in

subject and in area, and which will provide a basis for coordinated stream improvements by Federal, State, and local Government and by private enterprise, to the end that any and all developments, when or by whom carried out, shall fit into a proper plan for conservation of interstate water resources.

With the exception of the stream-flow records obtained by the Water Resources Branch of the United States Geological Survey, the precipitation records of the United States Weather Bureau and, to a lesser extent, similar data collected by State and private agencies, the hydrologic data on the New England streams is extremely meager. The water resources committee of the Commission, finding that this lack of information prevented the carrying out of a comprehensive study of water resources in the Connecticut Valley, cooperated in preparing a W. P. A. project for the collection and compilation of additional data. The data to be collected is divided into two broad subdivisions: (A) basic data and (B) stream uses or improvements. Items in group A include precipitation, surface waters, evaporation, ground water, snow surveys, quality of water; and in group B, public water supply, industrial water supply, power, stream regulation and flood control, prevention of pollution, navigation.

The Commission instructed its water resources consultant to prepare four separate W. P. A. projects to be set up respectively under the sponsorship of the New Hampshire, Vermont, Massachusetts, and Connecticut State planning boards. These projects are to be coordinated by a technical director approved by the four State sponsors, assigned from the staff of the Commission. The chairman of the water resources committee acts as consultant for the projects.

At present, project applications have been submitted to the W. P. A. by all four State planning boards and those of Vermont and Massachusetts have been approved and authorized. Approval and authorization in the other two States are expected shortly.

Through the cooperative efforts of the several State planning boards and the commission, there is renewed emphasis throughout the region on intelligent planning for the conservation of New England water resources. If interstate compact commissions similar to those now in New Hampshire and Connecticut are set up, the time is not far off when through comprehensive cooperation New England can make full economic use of its water resources.[1]

[1] Interstate compact commissions set up in Vermont and Massachusetts in April and May, respectively (1936). First meeting of all four commissions held in Boston, June 3, 1936.

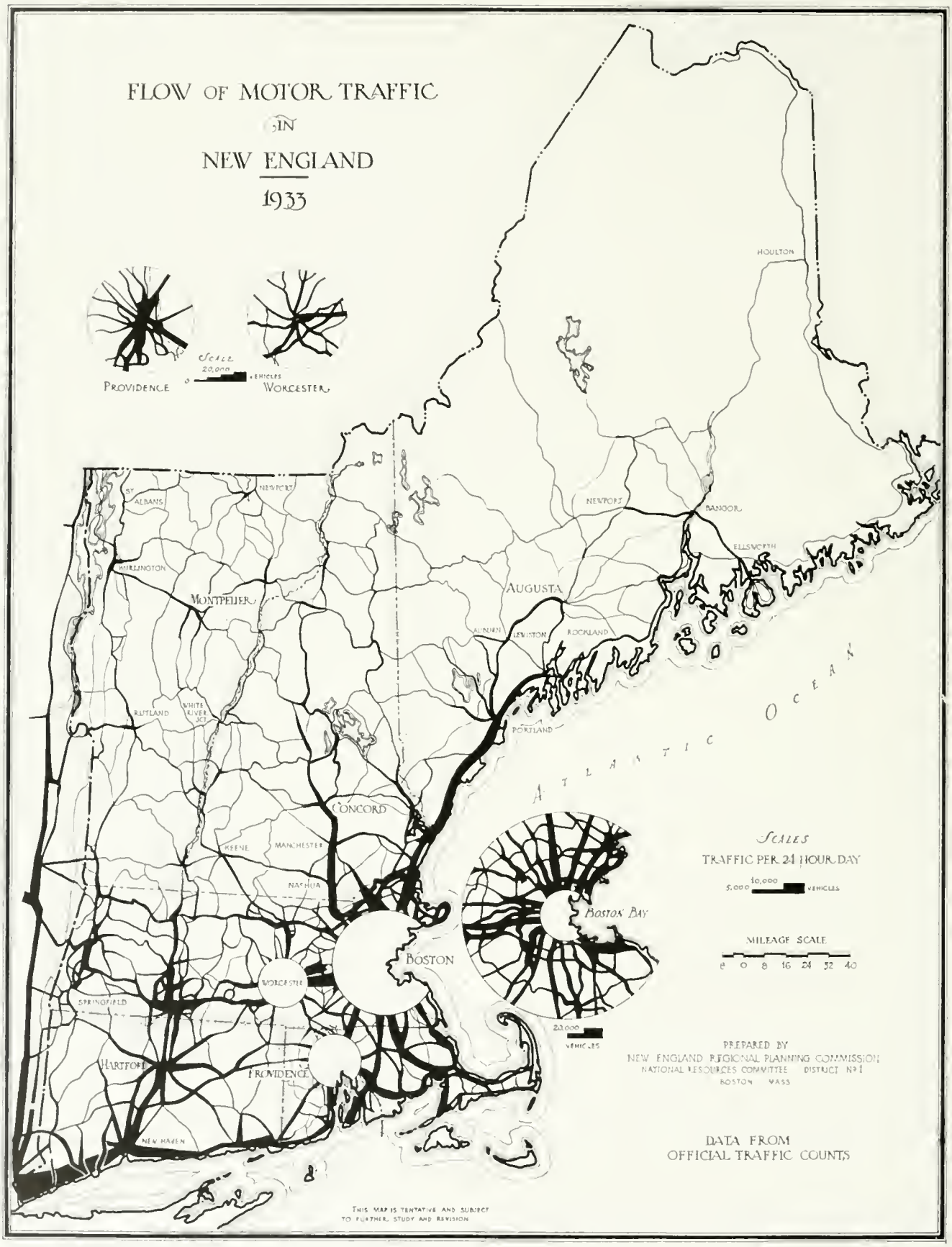

FLOW OF MOTOR TRAFFIC
IN
NEW ENGLAND
1933
PROVIDENCE
SCALE
20,000
VEHICLES
WORCESTER
HOULTON
NEWPORT
BANGOR
ELLSWORTH
AUGUSTA
AUBURN
LEWISTON
ROCKLAND
PORTLAND
ATLANTIC OCEAN
ST ALBANS
NEWPORT
BURLINGTON
MONTPELIER
RUTLAND
WHITE RIVER JCT
CONCORD
KEENE
MANCHESTER
NASHUA
BOSTON
Boston Bay
WORCESTER
SPRINGFIELD
HARTFORD
PROVIDENCE
NEW HAVEN
SCALES
TRAFFIC PER 24 HOUR DAY
10,000
5,000
VEHICLES
MILEAGE SCALE
0 8 16 24 32 40
20,000
VEHICLES
PREPARED BY
NEW ENGLAND REGIONAL PLANNING COMMISSION
NATIONAL RESOURCES COMMITTEE DISTRICT No 1
BOSTON MASS
DATA FROM
OFFICIAL TRAFFIC COUNTS
THIS MAP IS TENTATIVE AND SUBJECT
TO FURTHER STUDY AND REVISION

FIGURE 67

STAFF REPORT—SECTION V
TRANSPORTATION

Highways

A plan for highway circulation coordinated with all other transportation media is an essential part of a planning program for New England. The social, economic, and political well-being of the region depends greatly upon the facility with which motorists may travel safely, conveniently, and economically into and about New England.

History shows that at intervals, changes in transportation media require readjustments in the character and design of the entire system. Recent developments of the automobile, greater volumes of traffic, greater weight of loads, and vastly increased speed of highway travel have brought about a turning point in the history of highways. It is, therefore, important to study what changes in the character and location of highways are necessary in order to adjust them to modern developments in all phases of transportation.

History of Roads in New England.—The early New Englanders settled along the seacoast, and used water communication almost exclusively. As the region developed and the need for new fertile farms and home sites became imminent, the settlers followed the water courses and Indian trails to their new homes. This migration resulted in a pattern of paths or trails radiating from the seacoast.

To the time of the Revolutionary War nothing had been done toward the establishment of a New England road-building program. The few roads between communities were not maintained systematically; permanent bridges were unknown, and traveling conditions were deplorable. The exorbitant land transportation rates resulted in the movement of freight almost entirely by water. Consequently, until well into the nineteenth century most inland communities were necessarily independent and self-contained, and the only roads maintained were in the communities between farm, church, meeting house, and mill.

The great need for good roads and the willingness of citizens to invest in private enterprise resulted in the formation of companies for the development of turnpikes. The construction of a turnpike between New London and Norwich, Conn., in 1792, introduced a new era of highways in New England. Turnpike companies, the first public-service corporations in New England, operated under State granted charters authorizing them to build and maintain new roads and to incorporate into their systems various sections of what had long been public highways. However, a committee, appointed by the legislature, established the toll rates and determined the location of roads and the number of toll gates to be erected.

The turnpikes enjoyed their greatest popularity between 1830 and 1850; then the development of the railroad made it apparent that private capital could not succeed in this field, and turnpikes gradually reverted to public control. Following the decline of the turnpike movement, highway development was relatively inactive until the late eighties, except for the building of a few unimportant plank roads in Vermont, Connecticut, and Massachusetts. However, during that period, the invention of the stone crusher by Blake in 1858, and of the steam roller by Lemaine in 1859, formed an important step in the progress of highway development and made possible the use of macadam road surfaces on an extensive scale.

The formation of the League of American Wheelmen in 1880 was a crucial point in the public attitude toward highway improvement. This organization worked energetically to secure better roads and was instrumental in the pasage of the New Jersey State Aid Road Law in 1891 which resulted in the first State Highway Department. By 1903, the six New England States passed similar laws setting up State highway departments. These laws were incorporated as follows:

Massachusetts	1892
Connecticut	1895
Vermont	1898
Maine	1901
Rhode Island	1902
New Hampshire	1903

The passage of State aid laws and the establishment of the Federal Office of Road Inquiry, in accordance with an act of Congress, 1893, were the initial steps toward the solution of road problems.

The importance of the State highway departments lay in the fact that valuable information on the best types of roads and the methods of construction was disseminated by the Federal office to the various States through these departments.

During the period of concentrated highway legislative activity, the innovation of horseless carriages resulted in the organization of the automotive industry.

Despite the fact that the use of horseless carriages increased rapidly in the urban areas, it was not until after 1904 that they became a general highway problem.

The decade following 1904 was marked by two significant changes: The first was a general increase in the distance of travel by highway, made possible by the use of the automobile; and the second was the development of interest in highway improvement by city dwellers, who wanted highways comparable to their best city streets. While this demand by city dwellers was resisted by the farmers in other sections of the country who favored the farm-to-market type of road development, the controversy did not become a factor in the New England States, as the distance between farm-to-market points was almost identical with the intertown or trunk-line pattern of roads.

The United States Bureau of Public Roads made the first step in settling the trunk-line question by requesting from the States a 5-year program of roadbuilding, on which they would need assistance from the subsidy authorized by the Federal Aid Road Act of 1916, by which an appropriation of 75 million dollars was to be expended in 5 years for the improvement of roads used by the United States mails.

However, the defect in this act lay in the fact that it permitted too wide a dispersion of Federal money, with no assurance that a complete arterial highway pattern would result in a reasonable time. This 1916 act was modified by the Federal Highway Act of 1921, which required that the Secretary of Agriculture and the State highway departments should jointly designate a system of important interstate and intercounty roads limited to 7 percent of the country's total road mileage to constitute the Federal-aid highway system. This system was limited to a paving program for existing roads; however, it resulted in a national network of State systems upon which future Federal appropriations would be expended. When the New England Regional Planning Commission came into being, no regional studies of desirable new locations in relation to existing roads had been made for New England.

Geographical Background.—The physical background of New England is a region of small topographical forms, of disconnected patches of arable land and pasture ascending to the natural barriers formed by the Berkshires, Green Mountains, and the Hudson River to the west, and the White Mountains and wild-wooded sections of Maine to the north. The Connecticut River Valley forms the largest major geographical feature. (See relief map opposite p. 1.)

Somewhat cut off by natural barriers from the rapidly growing areas of production and population in the United States, and off the most generally used trade routes between the interior and the East coast, it has been imperative for New England to establish the best means of communication with the rest of the United States and Canada. Hence, large-scale transportation construction, such as the Boston Post Road, the Boston & Albany R. R., and the Hoosac Tunnel was intended to maintain contact between New England and other regions to overcome the disadvantage of natural barriers.

Climate.—The complex New England climate includes fog, rain, sunshine, snows, frosts, and temperatures varying from 110° above zero to 40° below within a few short months, and all these conditions af-

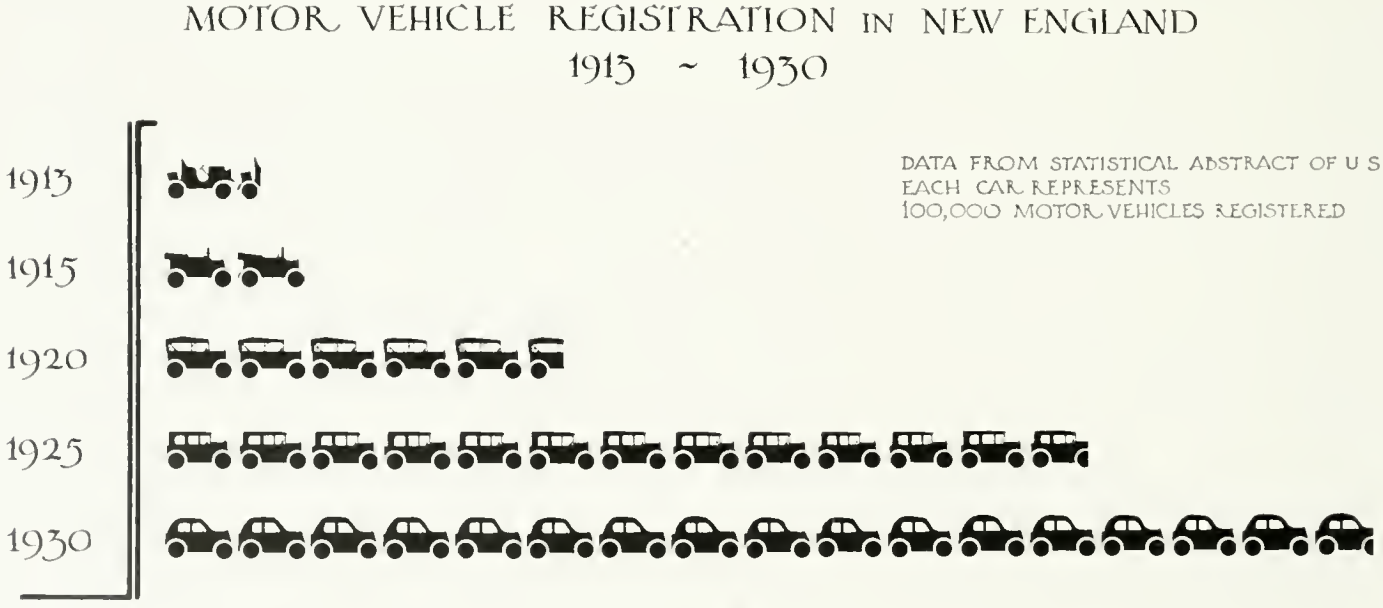


FIGURE 68

fect highway development. Fog, rain, snow, and ice affect the safety of highways; the depth of snowfall in the winter months necessitates the use of great fleets of snow plows and other equipment to keep open the main highways and farm-to-market roads; frost and low temperatures limit the highway construction season to about 8 months, and many rural roads are entirely inaccessible in the late winter and early spring due to mud and water.

Population.—New England has a total of over 8 million inhabitants, or nearly 7 percent of the population of the United States. Four-fifths of this number are concentrated in the States of Massachusetts, Rhode Island, and Connecticut, and three-quarters of the entire population live within 50 miles of the seacoast. (See the distribution and density charts and maps in the population section.)

The course of highway development in the past was fairly well defined, when the solution of the problem lay in linking the urban centers with other population regions within and without New England. Therefore, the intense concentration of population in southern New England has resulted in a similar concentration of highway construction, and has been responsible for the establishment of communication routes to the western sections of the country, and north to Maine, New Hampshire, and Vermont.

The large seasonal population of New England, estimated at about 3 million visitors during a 100-day period in the summer of 1928, increased to over 4 million during the summer of 1935. The resulting tourist traffic has presented an additional highway problem: that of providing adequate connections between all large centers of population and main areas of tourist attraction.

Motor Vehicle Registration.—The total number of motor vehicles registered in New England (including trucks and busses) has increased over 14 times in the past 20 years. In 1913, the first year in which reliable figures were available, 121,327 vehicles were registered and this number increased steadily to a total of 1,698,619 in 1930. (See fig. 68.)

Total registrations reached the peak of 1,716,514 in 1931; decreased in 1932 and 1933, and had a slight increase over the previous 2 years in 1934. While 1935 figures are not available, estimates indicate that the total registrations will be over the 1931 mark. Figure 69 shows a comparison of population and motor-vehicle registration from 1913 to 1930. In 1913, there were approximately 56 persons per car registered as compared with 4.8 persons per car in 1930.

Motor-truck registrations in New England have not shown such a marked increase as passenger cars. In 1926, the first year in which accurate figures are available, 200,324 motor trucks were registered and registrations reached the peak of 241,575 in 1931. (Statistics from United States Bureau of Public Roads.)

Approximately 26 percent of the 241,405 trucks registered in New England in 1931 were operated by fleet owners.

Trucks operated by fleet owners in New England, 1934[1]

5–9 trucks		10–24 trucks		25 and over		Total	
Fleet owners	Trucks operated	Fleet owners	Trucks operated	Fleet owners	Trucks operated	Fleet owners	Trucks operated
1,026	6,708	1,108	19,366	419	38,669	2,553	64,812

[1] Statistics from the Chilton Co., January 1935.

Approximately 25 percent of the trucks registered in New England in 1930 were on farms.

Motor vehicles on farms, 1930[1]

State	Motor vehicles	Passenger cars	Motor trucks	Percent of all trucks on farms
Maine	37,008	26,227	10,781	29.0
New Hampshire	15,618	11,079	4,539	32.4
Vermont	23,655	18,620	5,035	58.8
Massachusetts	27,210	17,638	9,572	9.7
Rhode Island	4,270	2,569	1,701	8.5
Connecticut	19,498	13,154	6,344	12.6
New England	127,259	89,287	37,972	25.2

[1] United States Census of Agriculture, 1930.

Trailer registrations for New England, including passenger car trailers, increased steadily from 2,227 in

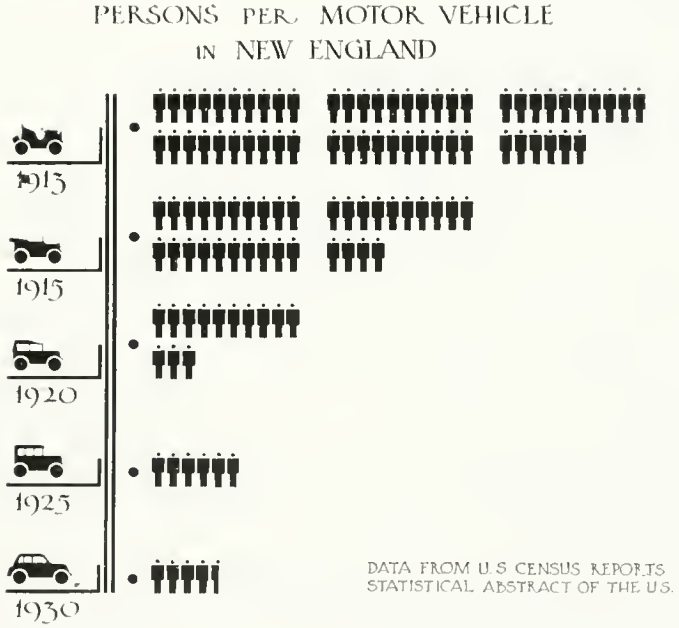


FIGURE 69

1927 to 11,165 in 1934 (United States Bureau of Public Roads).

Bus registrations for New England have increased from 1,581 in 1927 to 6,715 in 1934. (Figures obtained from actual censuses by "Bus Transportation.")

Visiting motorists practically double the total number of motor vehicles in New England during the summer season. It has been estimated that over 1,200,000 motor vehicles carrying approximately 3,400,000 persons visited New England during the summer of 1935, and approximately 180,000 vehicles carrying over 500,000 persons were here at any one time.

Highway mileage.—There were 86,913 miles of local and State roads in New England in 1913, and 83,744 miles in 1930. Although many miles of new roads have been built since 1913, a large percentage of the new work has been relocating and resurfacing on old right-of-way and the difference in the total mileage is accounted for in the gradual abandonment of unused roads in many rural areas. There were 17,903 miles of surfaced roads in 1913, or 20.6 percent of the total mileage, and this figure increased to 28,848 miles in 1930, or 34.4 percent of the total mileage. Figure 70 shows the comparison of surfaced road mileage to the total road mileage from 1913 to 1930, and figure 71 shows a comparison of motor-vehicle registration and surfaced roads from 1913 to 1930. In 1913, there were approximately 6 automobiles for each mile of surfaced road in New England, as against 59 automobiles per mile in 1930.

Approximately 13.3 percent of the total New England road mileage and 36.8 percent of the total surfaced road mileage is on the State highway systems under the supervision of the State highway departments, as shown in the following chart:

Mileage in State highway system

[Figures from U. S. Bureau of Public Roads]

State	Total mileage, local and State (1930)	Total mileage surfaced, local and State	State system			
			Total rural mileage	Rural mileage percent local and State	Total mileage surfaced	Percent total local and State surfaced
Maine	20,882	6,227	2,087	10.0	2,021	32.5
New Hampshire	12,034	3,060	2,948	24.5	2,911	95.0
Vermont	15,031	5,075	1,013	16.7	1,013	20.0
Massachusetts	18,802	9,682	1,795	9.5	1,795	18.5
Rhode Island	2,739	1,092	1,086	39.6	678	62.0
Connecticut	14,256	3,712	2,206	15.4	2,156	58.0
New England	83,744	28,848	11,135	13.3	10,574	36.8

Federal Aid Highway System.—The regulations governing the apportionment of funds to be spent on Federal aid highway projects are as follows:

One-third in the ratio which the area of each State has to the area of all States.

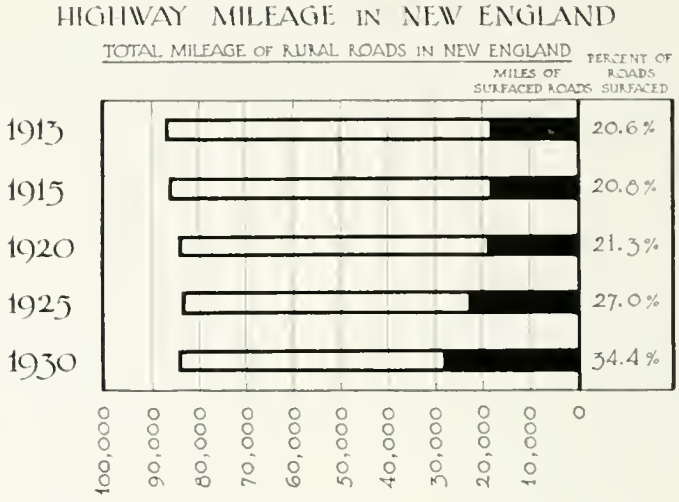


FIGURE 70

One-third in the ratio which the population of each State has to the total population of all States.

One-third in the ratio which the mileage of rural post roads and star-route mileage in all States.

The maximum payment that could be made from Federal funds appropriated prior to the fiscal year 1923, was $20,000 a mile; from funds for the year ending June 30, 1923, the maximum was $16,250 a mile. For the past few years Federal funds have been allotted equal to one-half the total cost without limitation. In each case the maxima are exclusive of the cost of bridges over 20 feet in span.

The Secretary of Agriculture must approve types of construction of projects upon which Federal aid is solicited. The selection by State authorities of the type of pavement to be used is subject to the approval of the Bureau of Public Roads.

If any State should fail to maintain its Federal aid roads, the Secretary of Agriculture is authorized to serve notice upon the State highway department. If within 60 days of notification repairs are not made, the Secretary of Agriculture is authorized and directed to make such repairs and charge the cost to whatever balance of Federal funds there may be remaining to the credit of the State. All future allotments to the State would be withheld until this money is refunded. With this cost refunded it would be reapportioned among all the States in accordance with the formula described above, so that the State would lose all but a small portion. It has never been necessary to enforce this provision of the Act.

The Federal aid highway system in New England incorporates many sections of the State highway systems and most of the United States numbered routes, and forms a fairly comprehensive regional pattern of highways between major centers of population.

The total approved mileage of Federal aid roads for New England is as follows:

Maine	1,611	As of Apr. 1, 1935.
New Hampshire	988.20	As of Feb. 1, 1934.
Vermont	1,765	As of Apr. 1, 1935.
Massachusetts	1,512	As of Jan. 1, 1935.
Rhode Island	494	Do.
Connecticut	1,019	As of Jan. 11, 1935.
Total	7,389.20	

Highway marking and route designation.—New England State highways have been uniformly numbered and designated in accordance with Federal regulations for several years. The United States numbered routes form the primary regional pattern that links New England with the other States and Canada.

The United States route numbers should not be confused with Federal aid route numbers, as the Federal aid numbers are used by the Bureau of Public Roads for administrative purposes only, and do not occur on any automobile road maps or on any highway route markers. The roads indicated on the map, "United States System of Highways", are designated by the American Association of State Highway Officials for uniform marking as approved by the Secretary of Agriculture.

The primary State-numbered routes of the six States complete the existing regional pattern of highways for New England. The secondary State-numbered routes and local roads form the network that supplements and acts as a feeder system to the regional pattern.

Standards.—The proper functions of a highway, the establishment of a definite highway classification and standards of construction based upon functions, have not been determined for New England. Trucks, busses, and pleasure cars using the same highway right-of-way have created dangerous and congested conditions that have ruined the charm of many New England villages. The Boston Post Road in lower Connecticut is an example of conditions resulting from the combined use of the highway for trucks, busses, and pleasure cars.

Highway authorities in New England have never had the legal rights enabling them to control the location of points of access to highways, since a highway is a strip of public land devoted to movement over which abutting property owners have the right of light, air, and access and vehicles may enter the traveled way at any point. Even new super-highway designs are not subject to borderland control, and while the new Boston-to-Worcester highway incorporates all modern methods of highway construction, vehicles may enter the traveled way at any point from abutting property. The resulting hazardous condition on New England highways is apparent from statistics prepared by the Travelers Insurance Co., Hartford, which show that 11.7 percent of all highway accidents in 1934 occurred at rural, driveway and street intersections.

Commercial establishments and advertising along highways have not been adequately controlled, and the results of unsightly roadside developments can be seen along most New England highways.

The new Merritt Parkway, in Fairfield County, Conn. (now under construction), is the first attempt

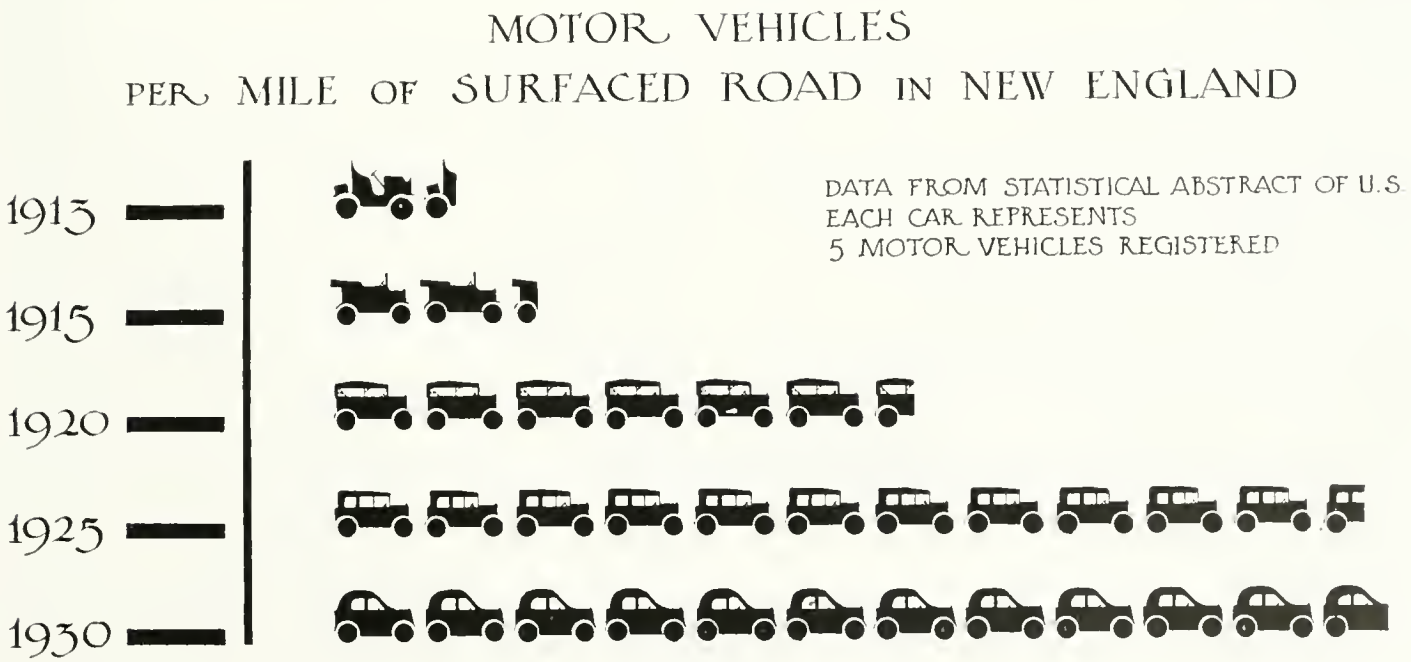


FIGURE 71

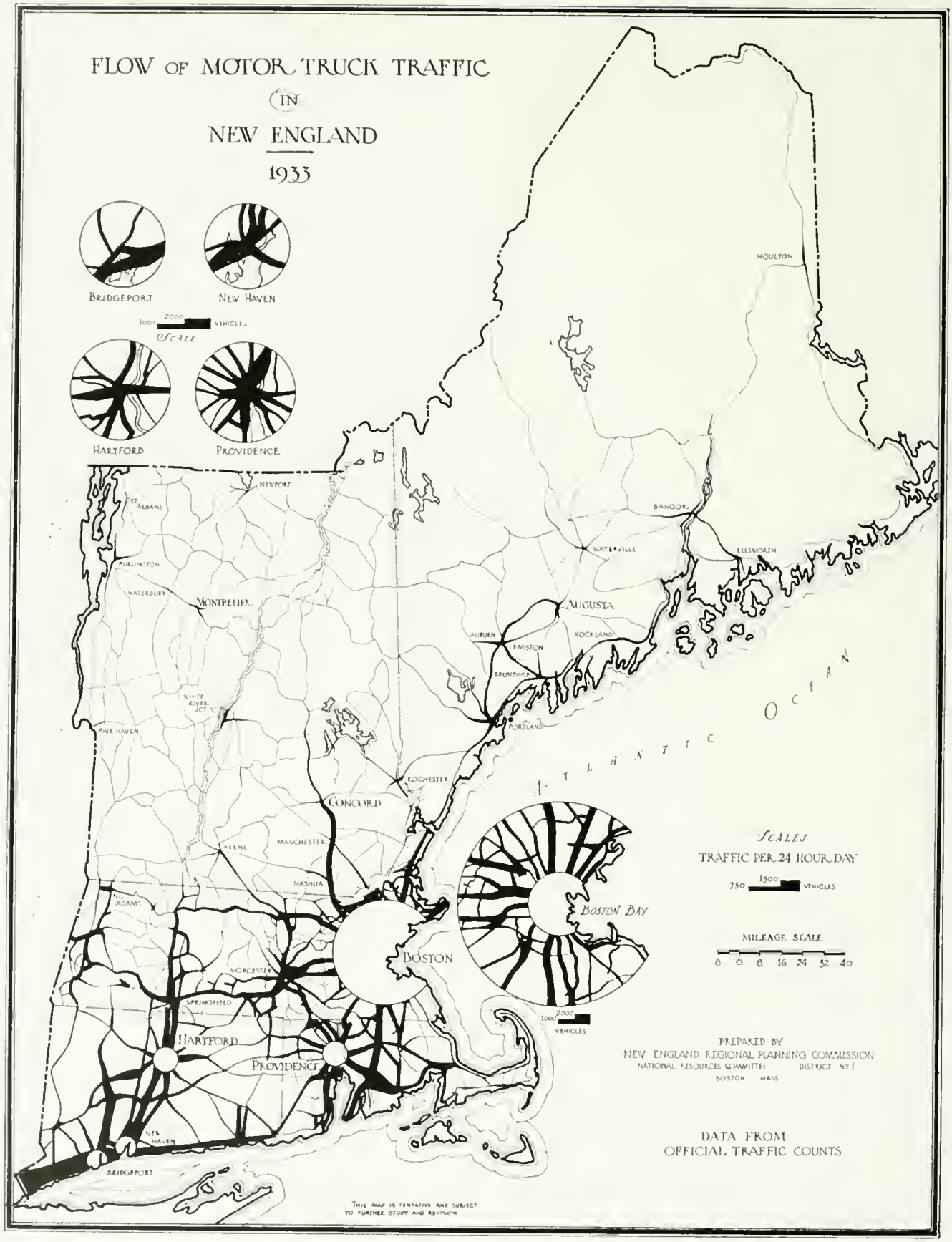

FLOW OF MOTOR TRUCK TRAFFIC
IN
NEW ENGLAND
1933
BRIDGEPORT
NEW HAVEN
SCALE
1000 2000 VEHICLES
HARTFORD
PROVIDENCE
NEWPORT
ST ALBANS
BURLINGTON
WATERBURY
MONTPELIER
WHITE RIVER JCT
NEW HAVEN
ROCHESTER
CONCORD
KEENE
MANCHESTER
NASHUA
NO ADAMS
WORCESTER
SPRINGFIELD
HARTFORD
PROVIDENCE
NEW HAVEN
BRIDGEPORT
BOSTON
BOSTON BAY
HOULTON
BANGOR
WATERVILLE
ELLSWORTH
AUGUSTA
AUBURN
LEWISTON
ROCKLAND
BRUNSWICK
PORTLAND
ATLANTIC OCEAN
SCALES
TRAFFIC PER 24 HOUR DAY
750 1500 VEHICLES
MILEAGE SCALE
0 8 16 24 32 40
100 2000 VEHICLES
PREPARED BY
NEW ENGLAND REGIONAL PLANNING COMMISSION
NATIONAL RESOURCES COMMITTEE DISTRICT No 1
BOSTON MASS
DATA FROM
OFFICIAL TRAFFIC COUNTS
THIS MAP IS TENTATIVE AND SUBJECT TO FURTHER STUDY AND REVISION

FIGURE 72

in New England to adopt the latest modern developments of parkway design, promoting safety and rapid movement of traffic and excluding all commercial vehicles. The borderlands are under ownership and control of the State, ensuring elimination of billboards and other commercial developments; and the right-of-way is permanently controlled against unauthorized access. The Merritt Parkway will help to relieve traffic congestion on the Boston Post Road, and forms an important parkway extension into New England from the Hutchinson River parkway in New York.

Surfaces.—Reinforced concrete is generally employed for the primary routes in New England. In Maine many of the primary State highways have been built mostly of gravel and in many instances have been treated with oil. Since many sections of New Hampshire and Vermont are not supplied with rock that would produce a high quality of broken stone, most primary roads have been built of cement concrete. The greater portion of Rhode Island highways have been constructed of cement concrete, because of the wealth of local sand and gravel deposits. Many Connecticut highways have been constructed of cement concrete, and broken stone has been used in the absence of local sand and gravel deposits. The abundance of stone materials in Massachusetts has resulted in the extensive use of bituminous concrete and bituminous macadam for road building.

The United States Bureau of Public Roads encourages the construction of roads of a surface type consistent with the local traffic requirements, but the cost not to exceed the proportionate transportation savings. To insure uniform practice in road building, the stage-construction policy has been actively encouraged. This policy develops the highway by easy stages; the road is first graded and drained, then as increased traffic conditions warrant, a gravel or crushed stone surface is added; finally, when traffic volume becomes great enough, a bituminous or coarse concrete top surface is applied.

Highway traffic.—The widespread use of automotive transportation has resulted in a two-fold highway problem: Through traffic and local traffic. As highway traffic was originally concentrated in urban areas, roads were not designed to accommodate the present heavy load of through traffic and long-distance traffic is forced through urban areas, resulting in delay and congestion. Attempts to remedy this situation by widening and straightening local highways have proved to be but costly and ameliorative measures.

Traffic surveys have been made from time to time by the various State highway departments. These surveys have been made in different years and during various seasons, and a complete traffic survey has not yet been prepared for New England.

Using the State traffic surveys, together with trends of motor-vehicle registration and gas-consumption estimates, and adjusting the figures in the light of present conditions, the Commission has prepared traffic-flow maps for New England. These maps, figures 67 and 72, indicate the flow of motortruck traffic and the flow of all motor traffic as of 1933. The adjustment of figures and the relating of surveys was difficult, as the surveys were made at so many different times.

Table XV shows the extent and time of the State surveys from which the Commission's flow maps have been constructed.

TABLE XV

State	Year of survey	Season	Type of survey
Maine	1924	July 1 to Oct. 31	24-hour count, all vehicles.
New Hampshire	1926	July 17 to Oct. 16	Do.
Do	1931	July 16 to Oct. 15	Do.
Vermont	1926	do	Do.
Massachusetts	1933	August–October, 1 week.	24-hour count, Sunday and average day pleasure vehicles
Do	1933	do	24-hour count, average day commercial traffic.
Rhode Island	1931–32	Indefinite	16-hour count, 8 a. m. to midnight.
Connecticut	1931	Aug. 1 to Oct. 15	24-hour count, all vehicles.
Do	1934	March–April	Do.[1]
Do	1934	do	24-hour count, commercial traffic.[2]
Do	1933–34	Oct. 6, 1933 to Sept. 30, 1934.	Count adjusted to 24-hour basis, all vehicles.[3]

[1] Not used by commission because season did not represent peak conditions.
[2] Used by commission because commercial traffic does not fluctuate as is the case with pleasure vehicles.
[3] Not used since information was not available when the commission's maps were made.

Tourist Traffic.—Annually, more than 3 million visitors take advantage of the New England recreational resources, according to estimates of the New England Council. The volume of tourist traffic on the highways may be realized from the following statistics:

A traffic check made in March and April 1934 by the Connecticut State Department of Motor Vehicles on the Boston Post Road in Greenwich, near the New York State line, shows that only 20 percent of the traffic consisted of vehicles having local origin as well as local destination, and over 60 percent had out-of-State registration. A similar check on the Boston Post Road at Milford, Conn., showed that less than 8 percent was local and over 35 percent was from out of State. A traffic survey from July 16 to October 15, 1926, on New Hampshire's primary highway system, showed that over 50 percent of the total passenger-car traffic was out-of-State registration, and with one highway having as high as 75 percent of out-of-State cars

Traffic surveys in other New England States will probably show similar proportions of out-of-State cars.

If New England is to maintain her position as a recreation center, tourist traffic must be adequately accommodated on routes separated from congested local highways.

Highway Speeds.—A Massachusetts highway accident survey, prepared in 1934, shows speed conditions typical on principal New England highways. The results of the speed studies are summarized in table XVI.

TABLE XVI.—*Speed in miles per hour*

Place where observations were made	Maximum speed recorded	Average speed, fastest 15 percent	Average	Average speed, slowest 15 percent	Estimated minimum speed
Straightways	81.0	47.5	36.6	27.1	10
Long-radius curves	68.1	42.5	33.8	23.6	10
Hill crests	61.0	43.7	32.9	23.1	10
Short-radius curves	68.1	37.0	27.8	20.8	10
All observations	81.0	44.9	34.0	24.8	10

Connecticut recently set a maximum speed limit of 45 miles per hour. A speed census was conducted as a basis for the formulation of policies; covering 45,000 timed cars, this census disclosed an average speed of 41.2 miles per hour and a maximum speed of 77 miles per hour, busses averaging some 2 miles per hour faster than private cars.

There is no uniform maximum speed limit in the other New England States. In Massachusetts, any speed over 30 miles per hour, and in Maine, New Hampshire, and Rhode Island any speed over 35 miles per hour is prima facie evidence of reckless driving, with burden of proof to the contrary upon the driver. Vermont has set no limit but specifies speed must at all times be reasonable and proper, having due regard to the weather and to highway and traffic conditions so as not to endanger life, limb, or property.

Highway Accidents.—In the United States during 1935, the total motor injuries were over a million persons, and 36,400 deaths resulted. In New England, from 1930 to 1934, inclusive, there were approximately 8,595 persons killed and 367,588 persons injured on the highways, with an estimated economic loss of $429,750,000.

Highway hazards are partially responsible for the high mortality rates. Among the hazards are blind curves, hill crests, railroad crossings, intersections, underpasses, bridges, and parked cars. These hazards are not serious if cars are operated at slow and cautious speeds, but a Massachusetts highway accident survey reveals that "on the average, the speeds in the approach to hazards did not vary materially from the speeds through the hazards." The greatest reduction of speed at the approach to the hazard was found at railroad crossings, where the average speed was reduced from 32 miles per hour to 28 miles per hour.

Road location of automobile accidents resulting in persons killed and injured in 1934

	Percent of accidents
Between intersections	32.5
Rural intersections	3.2
Highway	19.0
Driveway	.4
Curve	4.8
Street intersections	38.1
Railroad crossing	.6
Bridge	1.4
Total	100.0

The above statistics by the Travelers Insurance Co., Hartford, show that 41.7 percent of all highway accidents in 1934 occurred at rural, driveway and street intersections.

Grade Crossings.—The grade-crossing problem has existed since the early days of railroading, when the principal factor was to safeguard the lives of persons using the crossings. Today there is the added factor of delay due to a heavy automotive traffic.

There are three types of grade crossings: Those that are adequately protected, but because of heavy use by both highway and railroad traffic cause delay resulting in serious economic losses; crossings that are inadequately protected and are therefore existing hazards; and crossings that are seldom used and therefore do not warrant expense for protection. The first type warrants a form of grade separation; the second, adequate protection; the third, closing altogether. Another factor of the grade-crossing problem, traffic conflict, has been studied by the New England Regional Planning Commission, and maps and charts have been prepared to show the relative importance of grade-crossing elimination from a traffic-conflict standpoint.

An active grade-crossing-elimination program, financed with Federal funds and under the supervision of the Bureau of Public Roads, is under way in New England.

Economies of Future Highway Development.—The New England highway pattern indicates that it is possible to travel almost everywhere in New England on well-surfaced roads. However, that does not necessarily mean that the development of the present system has been completed. Future highway development will be guided by a comprehensive program for the improvement and refinement of the present system based on facts and designed to invest the highway dollar wisely. Facts are secured by organized surveys covering such subjects as distribution and growth of

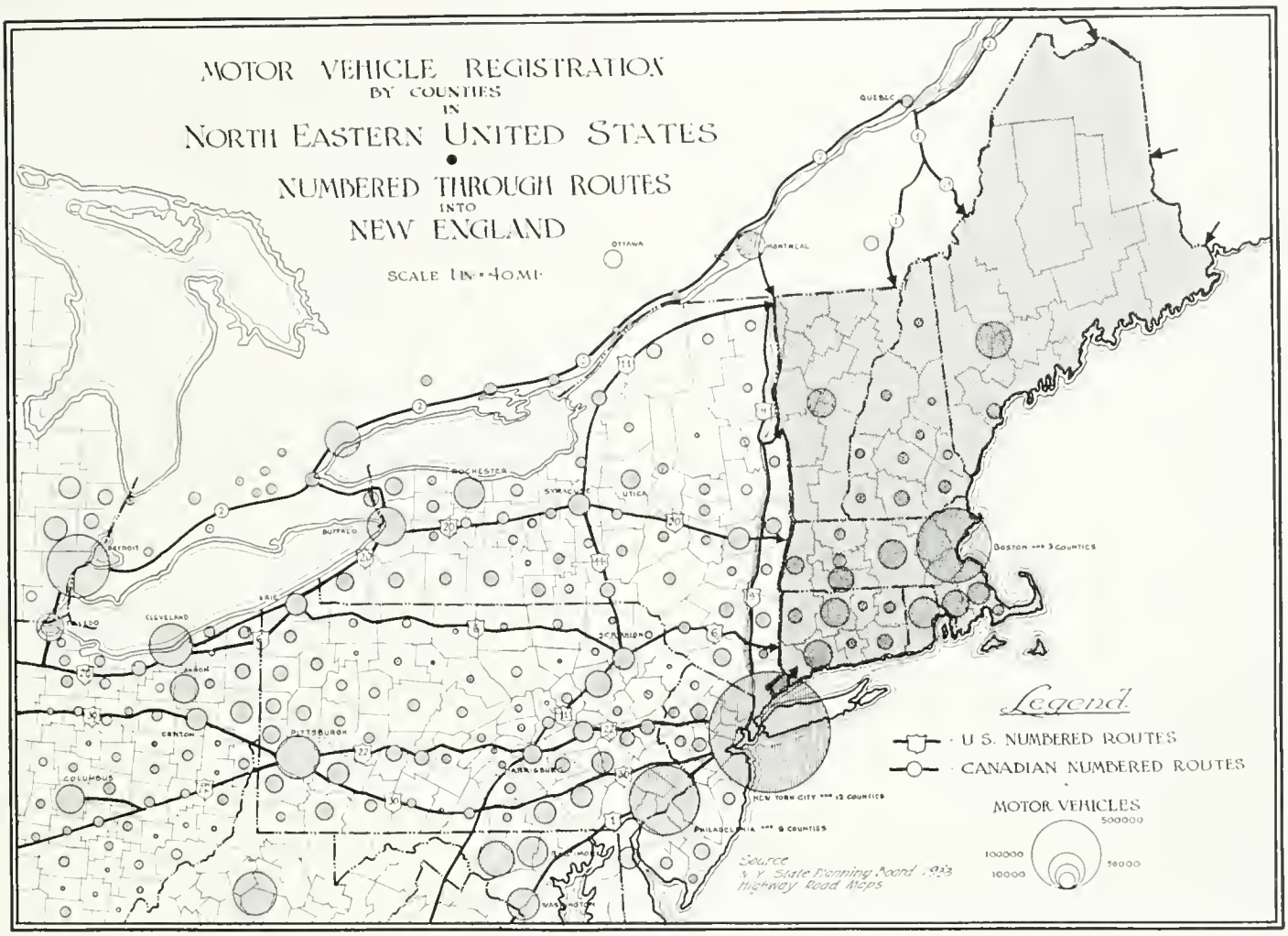


FIGURE 73

population, consumer activity, industry, and recreation; highway traffic (indicating volume, origin, destination, and types); highway expenditures; types, surfaces, and condition of present highways. These surveys are all fundamental in the development of a highway program.

The need for rational highway planning for New England is based on the following facts: the appalling record of highway accidents due to danger on the present highway system; traffic congestion in practically all major centers of population; the widespread spoliation of present highways due to unregulated use of borderlands; the increasing use of the truck as a transportation agent between manufacturing, distribution, and consumer centers; the danger that heavy commercial traffic will continue to ruin the charm and quiet of many New England villages; and the increasing use of New England as a four-season recreational center, causing severe traffic congestion on many routes of tourist travel.

A well-organized and executed planning program will eliminate these hazards present on most New England highways and allow automotive transportation to take its proper place in a coordinated transportation plan.

A program is needed for the gradual improvement of byroads in the local or feeder system of highways, which will make accessible for all-year living and enjoyment the whole of New England countryside, but at present a definite New England highway plan has not been formulated. Such a plan would mean savings in highway costs to each State, and the scenic charm of New England would be permanently preserved for the vacationist and resident alike.

Through Routes.—A great deal has been written about the design and control of through motor routes. The United States Bureau of Public Roads, in the report, Model State Enabling Act Empowering State Highway Departments to Construct and Maintain Freeways and Parkways, prepared by the Bureau for

the New England Regional Planning Commission, stated:

> The need for specialized express types of highways is now generally recognized, particularly in the more populous sections of the country. * * * From the Federal point of view, the broad interpretation of the oft-quoted phrase, "the public safety and general welfare", is quite sufficient to permit the construction of special highways of the express-way type at the present time. * * * Adherence to the system of highways as now planned is by no means the final step of highway development. Continued studies are needed with respect to the segregation of types of traffic and the most efficient type of highway to build to serve that traffic. * * * The human element is one of the major factors that must be kept constantly in mind when planning express ways. Rules and laws are poor remedies for bad conditions. Modern highways should be designed to reduce to the minimum inevitable human error, carelessness, and recklessness, which are responsible for most motorcar accidents. * * *

To provide for the necessary safe, speedy, and uninterrupted flow, routes of "freeway" or "limited way" type of design are necessary. Such design incorporates the following features:

1. Separation of opposing lines of traffic by a center park strip.

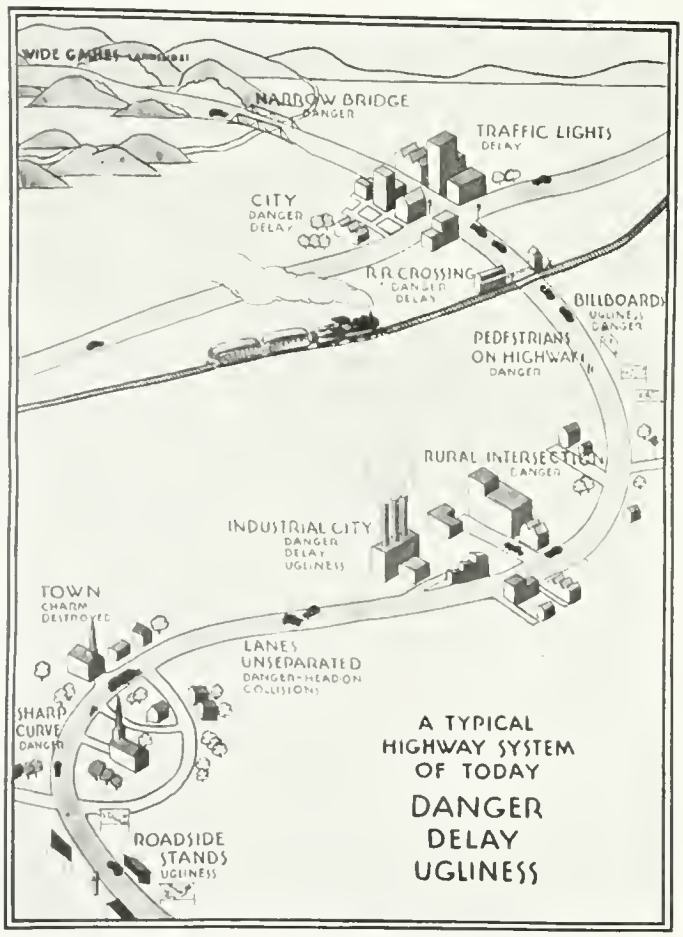


FIGURE 74

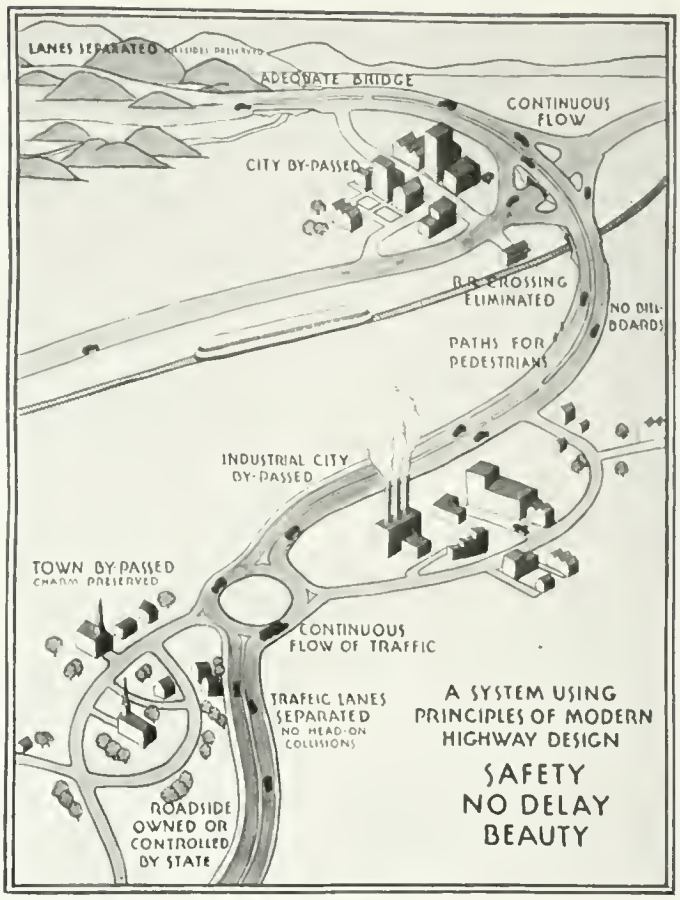


FIGURE 75

2. Grade separation or rotary-traffic design of intersections.

3. Control of the borderland by the State highway department to prevent access of vehicles except at properly located and designed entrances.

4. Provision for pedestrian paths along the highway and over bridges where justified by pedestrian traffic.

5. Proper curves, banking, and visibility for fast-moving traffic.

Once a highway of the "limited way" type has been properly constructed, a long step has been taken through engineering means toward the elimination of accidents and delay. Limited motorways would be built on new right-of-way, near urban population centers but not passing through them.

Cost is an important consideration, and Major Gilmore Clarke, of the Westchester County Park Commission, says regarding their experience in Westchester County:

> I have said that we can save money by building new roads for through traffic instead of widening old ones. A comparison between the cost of widening the Boston Post Road in Westchester County and that of constructing a parallel parkway a short distance away, but serving the same territory, should prove my point. In 1929 it was estimated that the cost

to widen the Boston Post Road from 66 to 166 feet would have been over $1,000,000 a mile for the land alone, whereas to purchase lands for the Hutchinson River Parkway, having an average width of 500 feet, cost an average of $264,000 a mile.

A still better example may be cited in the case of the Albany Post Road in the same county. To widen the Albany Post Road in 1929 from 66 to 166 feet was estimated to cost $792,000 per mile. Lands for the Saw Mill River Parkway, averaging 500 feet in width and paralleling the Albany Post Road at a distance varying from 1 to 2 miles, cost at the rate of $138,600 per mile. In other words, the cost to have widened the Albany Post Road would have been six times the entire cost of a 500 foot parkway.

In addition to savings in land costs, limited motorway design would bring about economy by accommodating more traffic per lane of pavement. There is also the indirect saving due to reduced accidents and consequent reduction in property damage, medical expense, wage losses, and insurance rates.

Legislation.—There is no enabling legislation in New England that permits the State highway departments to acquire and control land for the building of modern highways of the freeway or limited way type. At the request of the New England Regional Planning Commission, the Bureau of Public Roads made a study of legislation which would permit the construction of limited motorways.

The following bill providing for such legislation was introduced by the Fairfield County Planning Association, into the 1935 Connecticut Legislature:

Senate No. 461—An Act Authorizing Parkways or Freeways as Parts of the State Highway System

Be it enacted by the Senate and House of Representatives in General Assembly convened, In the interest of public safety, convenience, and general welfare, highways now existing or to be constructed may be designated by action of the Legislature, as parkways or freeways. To such designated ways, the owners of adjoining land shall have no right of light, air, or access, and in order to promote the efficiency of such ways and to protect the safety of the public, they may be specially designed; traffic thereon may be specially regulated; intersections thereof with other ways may be specially laid out and controlled; and they may be separated from adjoining private lands by buffer or protective lands of various widths owned or controlled by the State.

The designated ways herein referred to are declared to be parts of the highway system of the State and the State Highway Commissioner shall have the same right, power, and authority over such ways as over any other parts of the State Highway System and in addition, the said Commissioner is hereby given such power and authority as will enable him to carry out the purpose of this act, including the acquiring of additional land for buffer or protective strips: *Provided,* That whenever special highway or parkway commissions have been set up by legislative acts, such commission shall exercise, either exclusively or concurrently with the State Highway Commissioner, the rights, powers, and authority granted to them in such acts.

The acquisition, improvement, and embellishment of the ways and the lands herein referred to, together with the maintenance thereof and all incidental proceedings in connection therewith for the purpose of carrying out the provisions of this act are hereby declared to be for a State purpose.

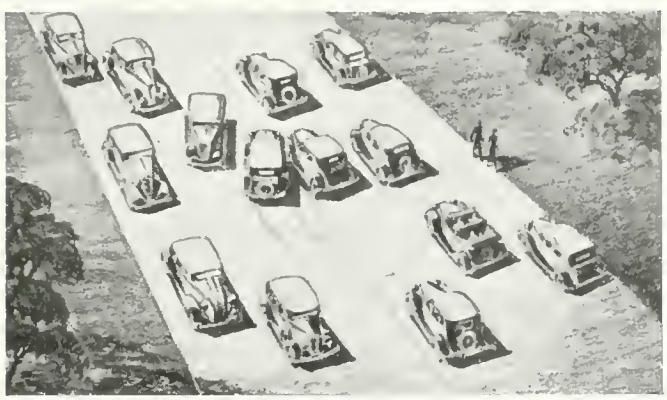
No action was taken by the legislature on this bill. A similar one introduced into the 1935 Massachusetts Legislature was not passed.

Two freeway bills were introduced into the 1936 Massachusetts Legislature. The first, presented by the Massachusetts Federation of Planning Boards, is as follows:

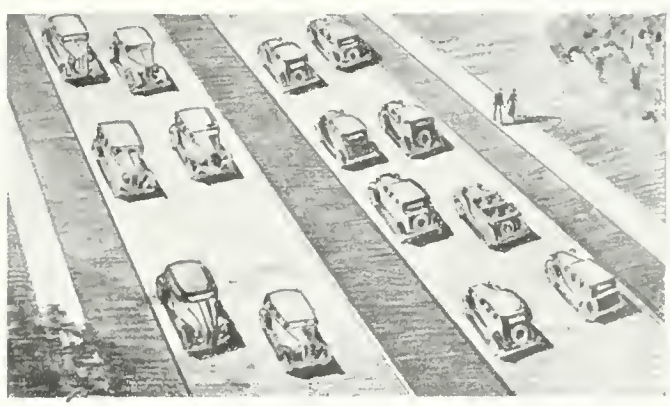
House No. 205.—An Act Relative to the Laying Out and Care by the Commonwealth of Freeways and Making Certain Laws Applicable to Such Ways

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same as follows:

Section four of chapter eighty-one of the General Laws (Tercentenary Edition) is hereby amended by inserting in the third line, after the word "Highway", the words: * * * or freeway, * * * and adding to the end of said section the following: * * * All the provisions herein and of existing laws relating to State highways shall apply to freeways, except that the owners and occupants of land abutting thereon shall



Driver trying to "beat the line of traffic" is unable to find an opening and is caught between the opposing lines of traffic.



Separation of opposing lines of traffic eliminates "beating the traffic line."

FIGURE 76

MODERN HIGHWAY PRACTICE

TYPICAL CROSS SECTIONS OF LIMITED MOTORWAYS

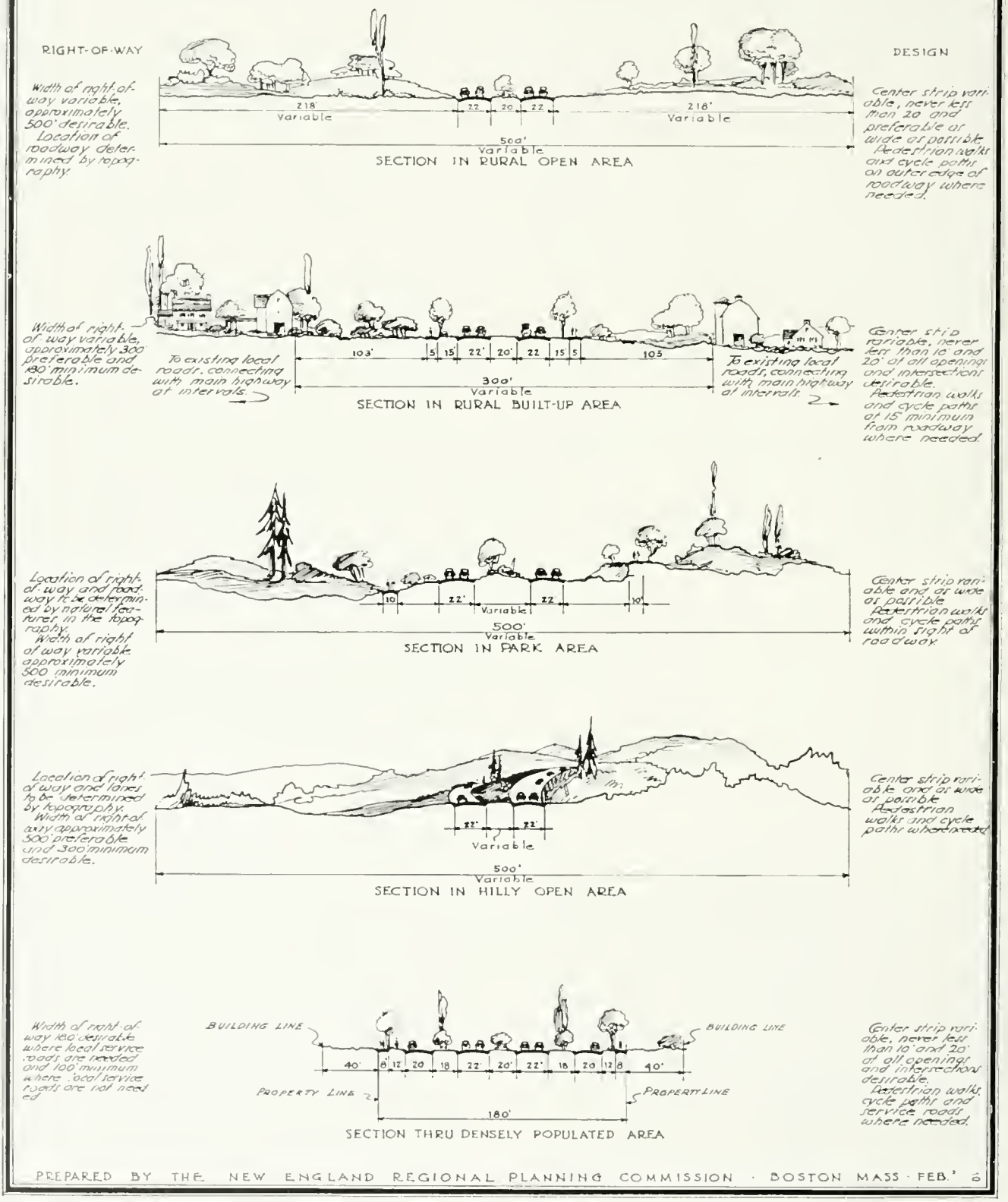

RIGHT-OF-WAY
DESIGN
Width of right-of-way variable, approximately 500' desirable. Location of roadway determined by topography.
218' Variable
22
20
22
218' Variable
500' Variable
SECTION IN RURAL OPEN AREA
Center strip variable, never less than 20 and preferable as wide as possible. Pedestrian walks and cycle paths on outer edge of roadway where needed.
Width of right-of-way variable, approximately 300 preferable and 180' minimum desirable.
To existing local roads, connecting with main highway at intervals.
103'
5
15'
22'
20'
22
15'
5
105'
300' Variable
To existing local roads, connecting with main highway at intervals.
SECTION IN RURAL BUILT-UP AREA
Center strip variable, never less than 10' and 20' at all openings and intersections desirable. Pedestrian walks and cycle paths at 15' minimum from roadway where needed.
Location of right-of-way and roadway to be determined by natural features in the topography. Width of right of way variable approximately 500 minimum desirable.
10'
22'
Variable
22'
10'
500' Variable
SECTION IN PARK AREA
Center strip variable and as wide as possible. Pedestrian walks and cycle paths within right of roadway.
Location of right-of-way and lanes to be determined by topography. Width of right-of-way approximately 500' preferable and 300' minimum desirable.
22'
22'
Variable
500' Variable
SECTION IN HILLY OPEN AREA
Center strip variable and as wide as possible. Pedestrian walks and cycle paths where needed.
Width of right-of-way 180' desirable where local service roads are needed and 100' minimum where local service roads are not needed
BUILDING LINE
BUILDING LINE
40'
6'
12'
20'
18'
22'
20'
22'
18'
20'
12'
6'
40'
PROPERTY LINE
PROPERTY LINE
180'
SECTION THRU DENSELY POPULATED AREA
Center strip variable, never less than 10' and 20' at all openings and intersections desirable. Pedestrian walks, cycle paths and service roads where needed.
PREPARED BY THE NEW ENGLAND REGIONAL PLANNING COMMISSION · BOSTON MASS · FEB.' 8

FIGURE 77

have no right of access to such freeways and access thereto shall be had only over public ways existing or thereafter laid out connecting with such freeways.

A hearing on this bill was held before the legislative committee on highways and motor vehicles on January 21, 1936, when several planning agencies spoke in favor of its passage.

The second bill, introduced by the Massachusetts State Planning Board, is as follows:

House No. 1021 An Act Providing for State Freeways

Chapter eighty-one of the General Laws is hereby amended by adding at the end thereof under the caption "State Freeways" the following new section:

Section 32. State Freeways may be laid out, acquired, constructed, maintained, and discontinued in the same manner as now provided for State Highways. A Freeway is a way over which abutters have no right of light, air, or access.

The Commission is making a study of the English Freeway Act entitled "Restriction of Ribbon Development" passed in December 1935. This act empowers the highway authority to acquire land for the construction of roads and to restrict building and access along the border lands. An interesting feature of this act is the provision for damages.

No compensation is payable for restrictions as to access to any road widened or constructed by the highway authority unless the road incorporates land which was road or proposed road and the access in question was related to it.

In other words, if a land owner cannot prove that there was an existing way to the location of the new road before such a road is built, then he has no claims to access after the road is built and cannot claim damages for denial of access to the road.

Highway Studies by the New England Regional Planning Commission.—Shortly after the Commission was organized in March 1934, initial steps were undertaken for the development of a broad regional motorway plan. A study of all available circulation data showed that the major highway problem is that of regional through traffic, and the Commission has concentrated on the study and development of a through route pattern.

At a Commission meeting, September 12, 1934, a system of limited motorways was presented and discussed as a solution to the problem of through long-distance traffic. A diagram and statement of such a system were sent to the New England State planning boards for their study and criticism, and the limited motorways program is being revised in the light of their comments and suggestions.

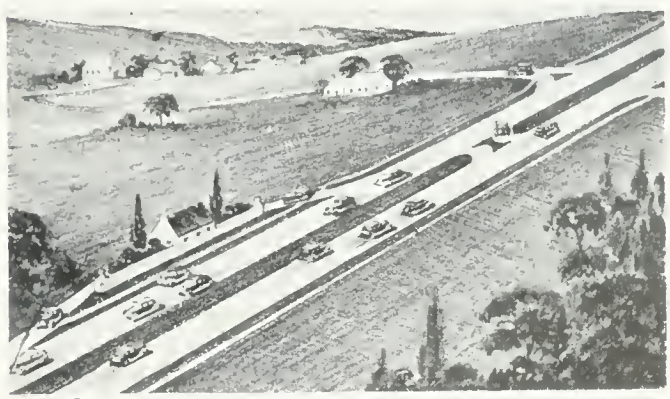
As further interest in limited motorways increased the Commission made a study for a Boston-to-Washington limited motorway. The Boston-Washington route would form an important link in a through route under consideration by the National Park Service connecting the Acadia National Park in Maine to the Everglades National Park in Florida.

The principle of limited motorway design has been publicized extensively by the New England Regional Planning Commission. In cooperation with the New England Council, the Commission prepared a bulletin, Limited Motorways, and more than 5,000 copies have been distributed throughout New England.

Preliminary data for a New England motorway study was prepared by the staff of the Commission and discussed by the board of consultants at their meeting in January 1936. As a result of this meeting, it was recommended that committees on land and water transportation be appointed, to cooperate with the existing committee on air transportation, in the preparation of a program of research and planning for coordinated transportation for New England.

It is a policy of the Commission to focus the light of the best available talent on each portion of the planning program by drafting men of the highest accomplishment in specific subjects for such committee work.

A typical development along our main highways today. Movement of cars into and from gas stations and stands greatly reduces capacity as well as safety of the highway.



Control of border land and its uses excludes unnecessaay gas stations, roadside stands and private access.—Capacity of highway increased 200%-300%.

FIGURE 78

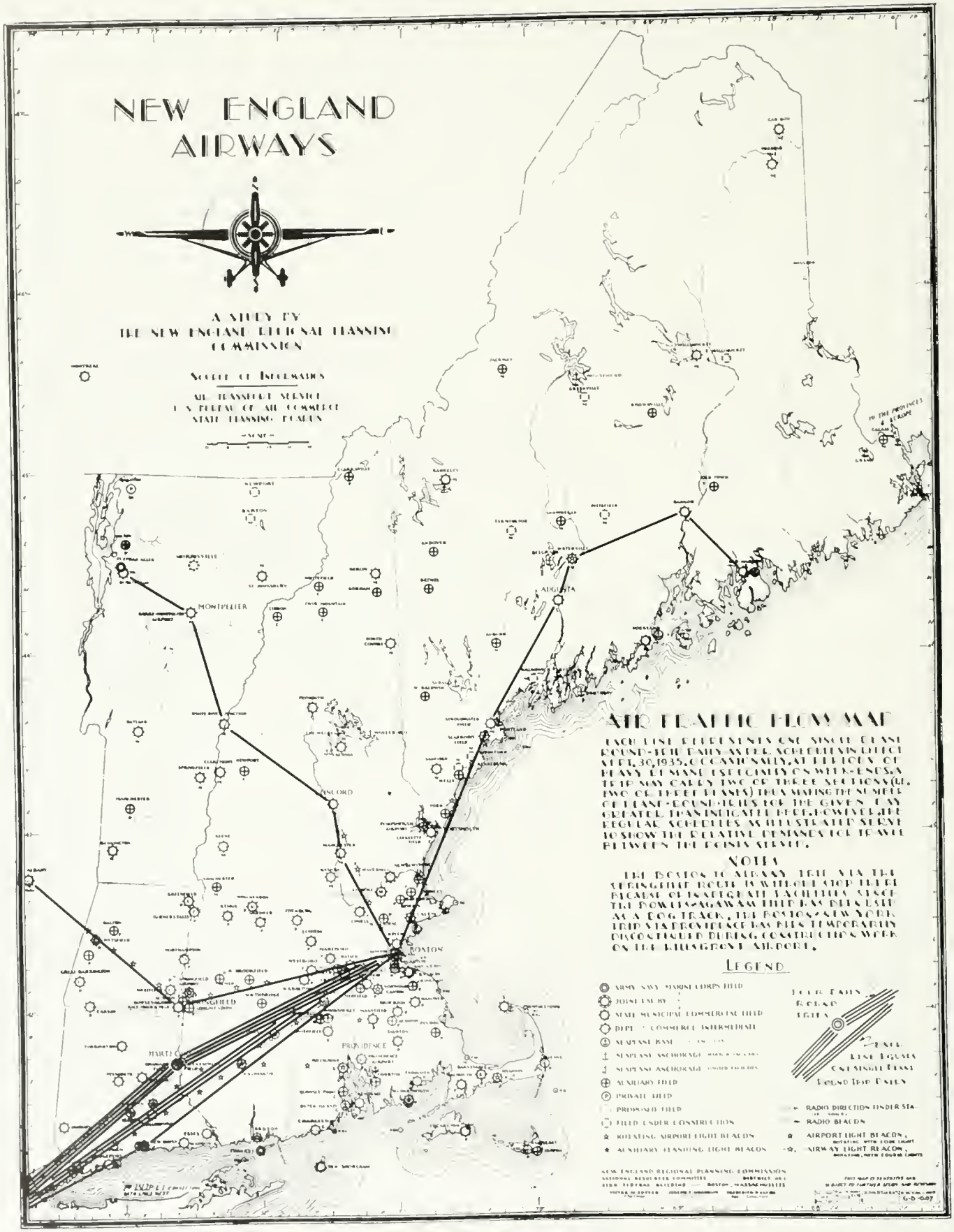

NEW ENGLAND AIRWAYS
A STUDY BY THE NEW ENGLAND REGIONAL PLANNING COMMISSION
SOURCE OF INFORMATION
AIR TRANSPORT SERVICE
U.S. BUREAU OF AIR COMMERCE
STATE PLANNING BOARDS
AIR TRAFFIC FLOW MAP
EACH LINE REPRESENTS ONE SINGLE PLANE ROUND-TRIP DAILY AVERAGE SCHEDULE IN EFFECT APRIL 30, 1935. OCCASIONALLY, AT PERIODS OF HEAVY TRAFFIC IN MAINE ESPECIALLY ON WEEK-ENDS, A TRIP MAY CARRY TWO OR THREE SECTIONS (I.E. TWO OR THREE PLANES) THUS MAKING THE NUMBER OF PLANE-GROUND-TRIPS FOR THE GIVEN DAY GREATER THAN INDICATED HERE. HOWEVER, THE REGULAR SCHEDULES AS ILLUSTRATED SERVE TO SHOW THE RELATIVE DEMANDS FOR TRAVEL BETWEEN THE POINTS SERVED.
NOTES
THE BOSTON TO ALBANY TRIP VIA THE SPRINGFIELD ROUTE IS WITHOUT STOP BUT BECAUSE OF INADEQUATE FACILITIES SINCE THE DOWLING-AGAWAM FIELD HAS BEEN USED AS A STOP. THE BOSTON-NEW YORK TRIP VIA PROVIDENCE HAS BEEN TEMPORARILY DISCONTINUED DURING CONSTRUCTION WORK ON THE BILLINGHURST AIRPORT.
LEGEND
ARMY NAVY MARINE CORPS FIELD
JOINT USE
STATE MUNICIPAL COMMERCIAL FIELD
DEPT. OF COMMERCE INTERMEDIATE
SEAPLANE BASE
SEAPLANE ANCHORAGE
AUXILIARY FIELD
PRIVATE FIELD
PROPOSED FIELD
FIELD UNDER CONSTRUCTION
ROTATING AIRPORT LIGHT BEACON
AUXILIARY FLASHING LIGHT BEACON
TYPE OF PLANES
ROUND TRIPS
PLANE LINE EQUALS ONE SINGLE PLANE ROUND TRIP DAILY
RADIO DIRECTION FINDER STATION
RADIO BEACON
AIRPORT LIGHT BEACON, ROTATING WITH FOUR LIGHTS
AIRWAY LIGHT BEACON, ROTATING, WITH FOUR GREEN LIGHTS
NEW ENGLAND REGIONAL PLANNING COMMISSION
NATIONAL RESOURCES COMMITTEE
6-0-0.07
MONTPELIER
AUGUSTA
CONCORD
BOSTON
PROVIDENCE
HARTFORD
SPRINGFIELD

FIGURE 79

Certainly, adequate coordination of our present and future transportation facilities is worthy of the best thought and cooperative action of public and private transportation enterprises in the six New England States. The New England Regional Planning Commission provides the common meeting ground for such action.

Aviation

History and Growth of Aviation.—Aviation in America can no longer be considered an infant industry. It has proven itself capable of meeting the most severe tests of climate and weather, has conquered mechanical difficulties, and has competed successfully against the established means of transportation. Its formative period, under the tremendous stimulus of the World War, was one of brilliant accomplishment in mechanical and engineering advancement—of miraculous development in both plane and engine. The engineering genius responsible for these achievements in the face of seemingly impossible obstacles was finally rewarded by the sensational flights of Lindbergh, Chamberlain, Amelia Earhart, Byrd, and a host of others. These flights, coupled with the program of governmental encouragement introduced by the Air Commerce Act of 1926, served as a powerful stimulant to commercial aviation. Air mail flying has helped to put passenger transport flying on a sound commercial basis.

The phenomenal growth of aviation has been made possible only by a thorough and complete system of ground facilities and aids to navigation, such as weather bureau and broadcasting stations, radio direction beacons, light beacons, course markers, emergency landing fields, and other facilities and services provided either by the Department of Commerce or by transport companies. It has been said that 90 percent of the air transportation problem relates to ground organization. Certainly, without this highly organized system of ground facilities and communication, commercial flying on any large scale or with any degree of reliability or safety would be impossible.

New England had her share of the country-wide expansion of aviation. In 1929 Colonial Airlines established the first scheduled air lines in New England, making two round trips daily between New York and Boston. The demand for air travel in New England has grown to such proportions that today regular scheduled operation is carried on over 700 miles of airways. A further extension of the airways is contemplated in a seaplane service between Boston and New York. Eight round trips daily on a schedule of 75 minutes from midtown to midtown are planned.

New England is undeniably a small region from the point of view of air travel. However, the passenger traffic between New England and the national air network, coupled with the normal intraregional traffic, has reached substantial proportions. This development took place despite the handicaps of difficult terrain, adverse weather, and poor ground organization. The demand for connection between densely populated and highly industrialized southern New England and the sparsely populated and nonindustrialized northern part has resulted in the establishment of the two north-south lines—one leading from Boston into New Hampshire and Vermont, and the other from Boston into Maine. American Airlines, successor to Colonial Airlines, now operates eight round trips daily between New York and Boston, two with stops at Hartford and one with stops at New Haven. This company also operates an airline from Boston to Albany, via Springfield.

Regional and National Air Net Coordination.—The New England lines constitute an end link in the transcontinental system which has for its main terminal Newark, N. J., and allows connection for New England only after stop-over and a change of planes. Because much transcontinental traffic has its origin or destination in New England, her problems should be considered from a national point of view. When this aspect is considered, the 200- or 300-mile hops in New England, which, under ordinary local conditions would not encourage traffic, take on new importance as the first or last links in long air journeys. Saving of time is just as important at the end of a trip as anywhere along the route, and the demand for the end link is just as great as that for any other part of the chain. Hence, though no heavy intraregional traffic is in evi-

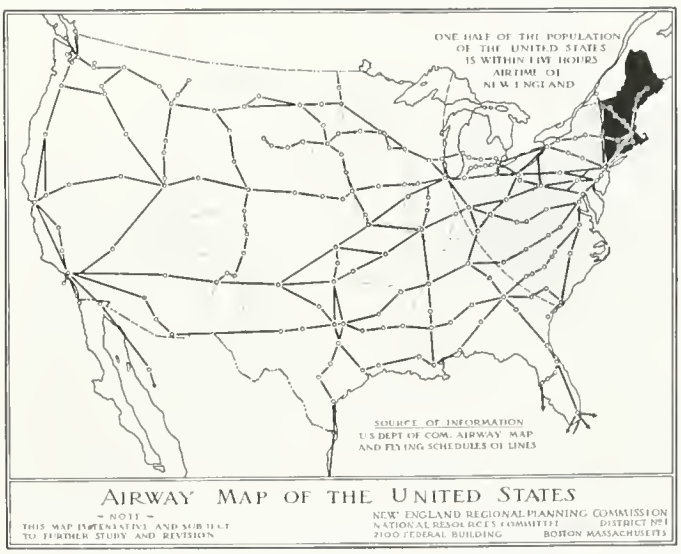

ONE HALF OF THE POPULATION OF THE UNITED STATES IS WITHIN FIVE HOURS AIRTIME OF NEW ENGLAND
SOURCE OF INFORMATION
U.S.DEPT OF COM. AIRWAY MAP AND FLYING SCHEDULES OF LINES
AIRWAY MAP OF THE UNITED STATES
- NOTE -
THIS MAP IS TENTATIVE AND SUBJECT TO FURTHER STUDY AND REVISION
NEW ENGLAND REGIONAL PLANNING COMMISSION
NATIONAL RESOURCES COMMITTEE DISTRICT No 1
2100 FEDERAL BUILDING BOSTON MASSACHUSETTS

FIGURE 80

dence, a potentially great interregional traffic may be awaiting establishment of adequate facilities which will enable New England to serve either as the origin or as the destination of much transcontinental air travel.

Recreational Travel.—The charm of New England mountains, lakes, and seashore, enhanced by recreational and sporting facilities, attracts vacationists from the entire country. Transportation therefore becomes vital, and air transportation can develop into a popular means of travel to and from these regions.

In actual flying time, Bar Harbor is only 1 hours from New York and only overnight from Chicago. A schedule of frequent service from these points to a recreation center like Bar Harbor could greatly increase recreational business.

It must be remembered, in laying out air service to recreational regions, that much of the appeal of New England lies in its relatively unspoiled wilderness. Focal points which will concentrate airplane activity should be chosen with care, to avoid destroying the very features that attract vacationists.

Because of inadequate ground facilities many of the proposed routes, such as the Connecticut Valley route, do not now lend themselves to commercial flying. The establishment of properly equipped routes would bring the entire recreational area of New England within a few hours of all the principal cities east of the Mississippi.

Trans-Atlantic Air Base.—The location of an air base to serve as the North American terminus for trans-Atlantic air service is a subject that undoubtedly deserves immediate study. Preparations are already under way for the establishment of scheduled air transport service from Europe to America. It is reported that negotiations are being made for the creation of a base on the European side at Speke Airport, Liverpool. Because New England is the area of this country nearest to Europe, it seems logical that the North American terminus should be somewhere in this region. Along the route, which would undoubtedly follow the coast for some distance, there should be developed necessary ground facilities, lights, radio direction beacons, and emergency landing bases of, perhaps, the combination land and seaplane type.

General Headquarters Air Corps Base.—A problem that will shortly demand consideration is that of a new general headquarters base in New England. The so-called Wilcox bill providing for the establishment of six major air bases throughout the country, one of which is to be located in New England, was signed by the President on August 12, 1935. Although the base is to be used primarily for training the general headquarters Air Corps pilots, it might serve in time of war as a New England frontier defense base, operating in coordination with a system of secondary supporting airports, each capable of sheltering and servicing various squadrons of the Air Corps. It would be vital in event of attack to have this support in order that the air force could be spread out over this entire theater of operations, and not concentrated in one spot. Such a program, chiefly in the interests of military aviation, would be greatly aided if coordinated with

Courtesy of the 26th Division Aviation, Massachusetts National Guard

FIGURE 81 Located in the hub of New England's airways. The East Boston Airport is a coastal gateway offering all modern ground facilities attendant upon efficient air travel.

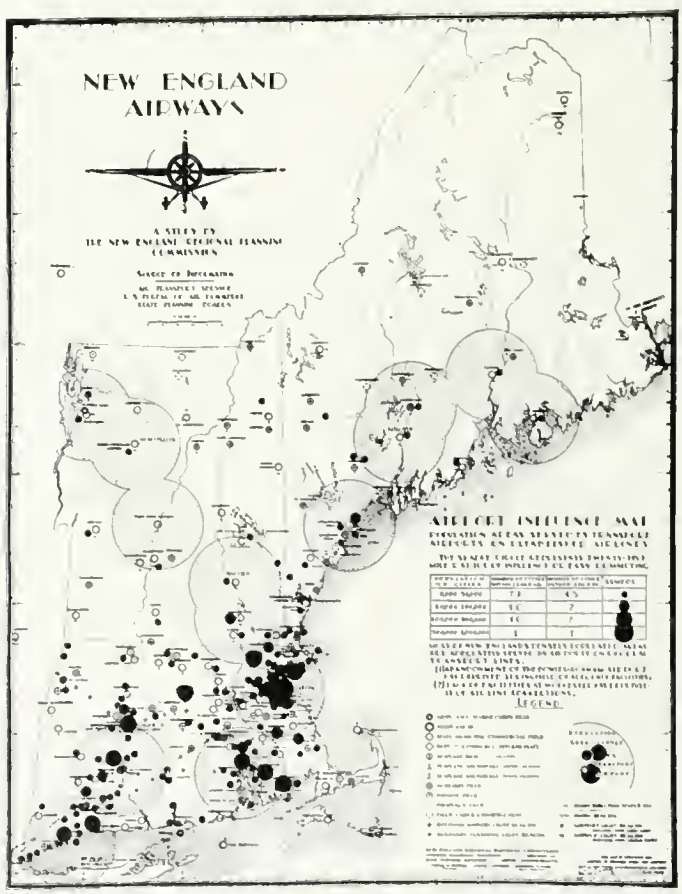


FIGURE 82

the demands and development of commercial airports. In that connection it is significant that the drydock at the Army base, just across the harbor from the Boston airport, is the only one on the Atlantic coast capable of handling the aircraft carriers, *Saratoga* and *Lexington*.

General Needs.—The Commission has made studies of the status of aviation in the New England region as regards the number of companies, the routes, the schedules, and number of planes in operation, and the condition of airports and ground facilities. This information has been gathered from various sources, all of which are believed to be reliable.

If New England is to overcome the handicaps imposed by the rough terrain, uncertain weather conditions and fog, it is essential that there be extension and development of the system of weather-observation stations, radio broadcasting stations, radio beams, lights, beacons, emergency landing fields, and all other ground facilities. Only with a complete system of ground facilities can New England expect to bid successfully for commercial and private flying, and adequately supplement present methods of travel to recreation centers. By making an early plan to guide development, difficulties can be overcome and waste avoided.

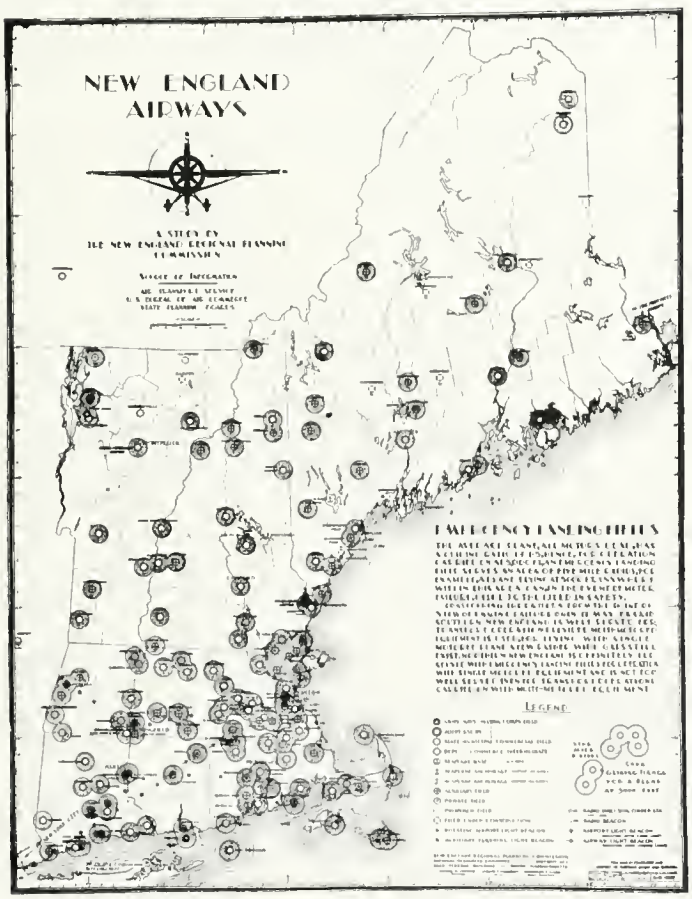


FIGURE 83

The Airport and its Area of Influence.—For purposes of study, analysis, and discussion, it is desirable to determine some figure denoting radius of influence of an airport in order to find out whether an area is sufficiently served by ports. The area of influence of any port is dependent upon its distance from other ports, the facilities it offers, and the distance of travel contemplated by the passenger.

Twenty-five miles has been assumed as the radius of influence of a port. Any larger radius would be so great that rather than commute to the airport, a prospective air traveler would probably go direct to his destination by private automobile, bus, or train. It is reasonable to assume that within the 25-mile radius the prospective air traveler would find it worthwhile to travel by air. By using a graphic method of presentation (fig. 82), it is obvious which areas are well served and which are not. By recording population-center information on the above-mentioned map, an idea may be gained of the percentage of population, and hence of the latent demand for air transportation, within convenient distance of an airport. Through the cooperation of the aviation committee, an origin and destination study of air traffic can be made, which will be of inestimable value in giving a picture of the needs which will determine the location of new facilities.

Emergency Landing Fields.—The problem of spacing emergency landing fields gives rise to the consideration of several interdependent factors—weather, condition of terrain, equipment used, altitude, communication facilities—in fact, almost all the factors that influence safe plane performance and navigation. For instance, the new twin-motored planes can maintain a ceiling of 11,500 feet on only one motor. With such equipment, the chance of forced landing because of engine failure is negligible. Only inclement weather

Courtesy Board of Selectmen, Bar Harbor, Maine

FIGURE 84.—Amid beautiful scenic surroundings in the heart of New England vacation land, the Bar Harbor airport provides both airplane and seaplane ground facilities.

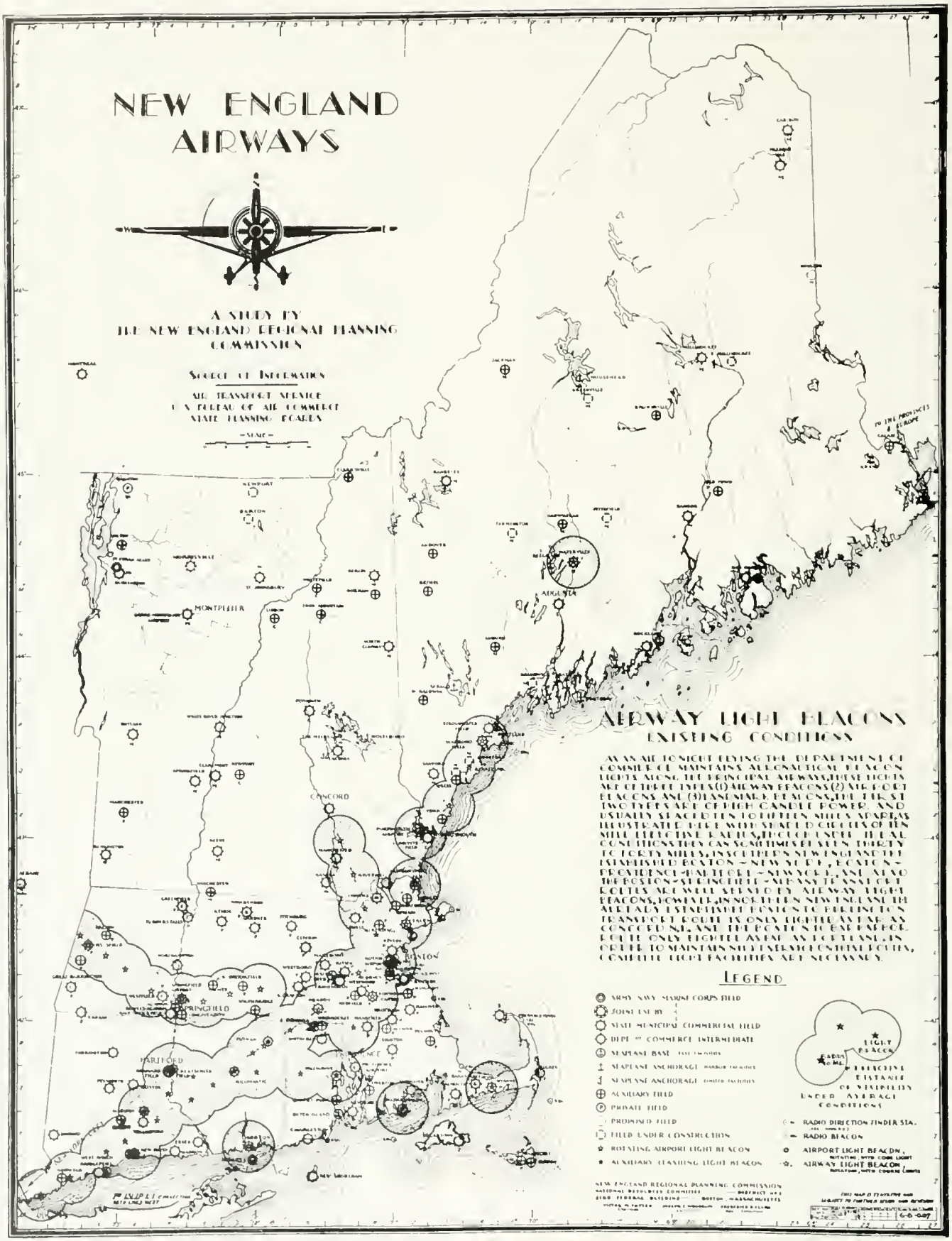

NEW ENGLAND AIRWAYS
A STUDY BY THE NEW ENGLAND REGIONAL PLANNING COMMISSION
SOURCE OF INFORMATION
AIR TRANSPORT SERVICE
U.S. BUREAU OF AIR COMMERCE
STATE PLANNING BOARDS
AIRWAY LIGHT BEACONS
EXISTING CONDITIONS
AIRWAYS ARE TO NIGHT FLYING THE DEPARTMENT OF COMMERCE MAINTAINS AERONAUTICAL BEACON LIGHTS ALONG THE PRINCIPAL AIRWAYS. THESE LIGHTS ARE OF THREE TYPES (1) AIRWAY BEACONS (2) AIRPORT BEACONS AND (3) LANDMARK BEACONS. THE FIRST TWO TYPES ARE OF HIGH CANDLE POWER AND USUALLY SPACED TEN TO FIFTEEN MILES APART AS ILLUSTRATED HERE WITH SPACED CIRCLES OF TEN MILE EFFECTIVE RADIUS, BUT UNDER IDEAL CONDITIONS THEY CAN SOMETIMES BE SEEN THIRTY TO FORTY MILES. IN SOUTHERN NEW ENGLAND THE ESTABLISHED BOSTON – NEW YORK, BOSTON – PROVIDENCE – HARTFORD – NEW YORK, AND ALSO THE BOSTON – SPRINGFIELD – NIAGARA TRANSPORT ROUTES ARE WELL SERVED BY AIRWAY LIGHT BEACONS, HOWEVER, IN NORTHERN NEW ENGLAND THE ALREADY ESTABLISHED BOSTON TO BURLINGTON TRANSPORT ROUTE IS ONLY EIGHTH IN IMPORTANCE AND THE BOSTON TO PORTLAND ROUTE ONLY EIGHTEENTH. IN ORDER TO MAINTAIN SUCH INTERSTATE AIRWAYS, COMPLETE LIGHT FACILITIES ARE NECESSARY.
LEGEND
ARMY NAVY MARINE CORPS FIELD
JOINT USE
STATE MUNICIPAL COMMERCIAL FIELD
DEPT OF COMMERCE INTERMEDIATE
SEAPLANE BASE
SEAPLANE ANCHORAGE
SEAPLANE ANCHORAGE
AUXILIARY FIELD
PRIVATE FIELD
PROPOSED FIELD
FIELD UNDER CONSTRUCTION
ROTATING AIRPORT LIGHT BEACON
AUXILIARY FLASHING LIGHT BEACON
LIGHT BEACON
RADIO BEACON
EFFECTIVE RANGE OF VISIBILITY UNDER AVERAGE CONDITIONS
RADIO DIRECTION FINDER STA.
RADIO BEACON
AIRPORT LIGHT BEACON
AIRWAY LIGHT BEACON
NEW ENGLAND REGIONAL PLANNING COMMISSION
NATIONAL RESOURCES COMMITTEE
DISTRICT NO 1
6-6-307
MONTPELIER
CONCORD
BOSTON
SPRINGFIELD
HARTFORD
PROVIDENCE
AUGUSTA

FIGURE 85

could force a landing, but with adequate ground organization and radio communication such an emergency would rarely arise.

Flying with adequate equipment is a different proposition than flying a single-motored plane at low altitude over rough terrain in New England at the mercy of sudden storms and fog.

Normally, the average plane has a gliding range—all motors dead—of about 1 mile horizontal flight per thousand feet loss in altitude. It is therefore assumed that the spacing of emergency landing fields every 10 miles is none too close for operations carried on at 5,000 feet. To illustrate, we have plotted on the emergency landing field map a circle of 5-mile radius around each port and emergency field, indicating that the average plane at 5,000 feet anywhere within this circle could glide safely to the port in the event of motor failure. This map shows that, except along the three regularly established airways in New England, cross-country flying can be done only at the hazard of forced landing on terrain which may or may not be suitable.

Radio Beacons.—The Department of Agriculture, cooperating with the Department of Commerce, operates

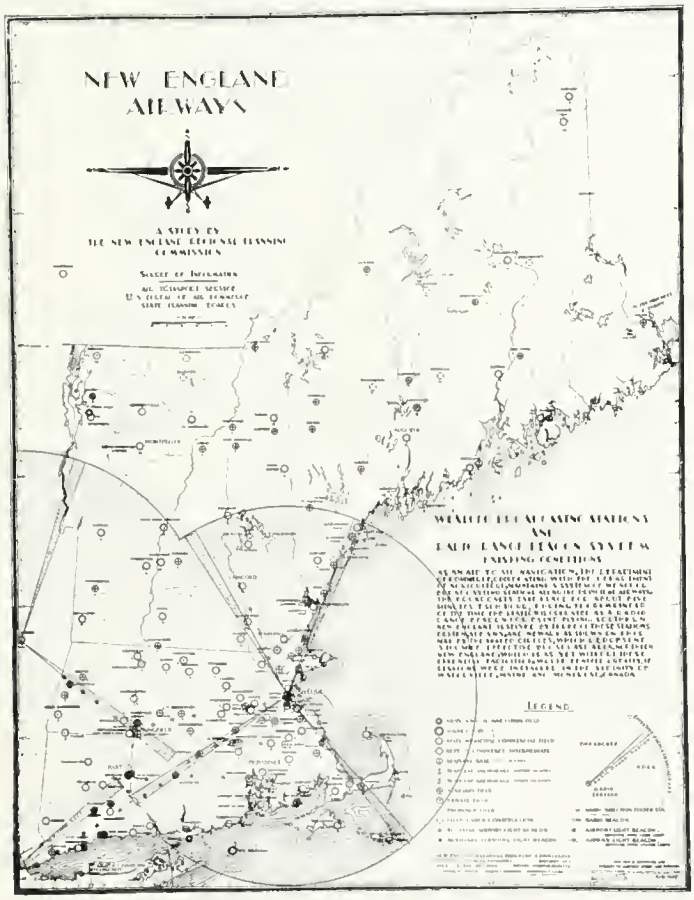


FIGURE 86

a system of hourly weather broadcasts from a Nationwide network of local broadcasting stations. Weather information is gathered from local stations throughout the system, and then such information as is important to the various sections is teletyped to the main broadcasting stations, which in turn broadcast only that information which applies to their section.

These stations are equipped to send out radio directional beam signals by which an aviator may fly blind. Thus, scheduled flights can continue in fog or storm. During the weather broadcast, which usually takes from 3 to 5 minutes, the beam is shut off. These reports consist of information regarding ceiling, atmospheric pressure, cloud formation, wind velocity, dew point, and general forecasts for the principal points within the area served by the station.

New England has only one such station, located at the East Boston Airport (fig. 86). Nevertheless, benefit is derived from the Newark station, which serves most of Connecticut, and the Albany station, which serves western Massachusetts. These stations have an effective broadcasting radius of about 100 miles, and the pattern of their location is so designed as to overlap the broadcast area of adjacent stations in order to give unbroken service to pilots flying mapped airways, so that they are always within radio range of a broadcasting station. The "radio beacon map" shows by use of the hundred-mile-radius circles the effective area served by the three existing beacons (Boston, Newark, and Albany), together with the area of Maine, New Hampshire, and Vermont, which could be served by a station at Bangor, Maine. This area, being of very rough terrain and subject to rapid weather changes, would greatly benefit from such a station.

Light Beacons.—The Department of Commerce provides a system of light beacons for night flying, usually spaced about every 10 miles along the established airways. The average light has a range of about 10 miles. Because the range varies greatly with conditions of visibility, the area served by each light beacon is shown in figure 85 as of 5-mile radius. The New York-New Haven-Boston route is adequately provided with night-flying facilities and beacons; the airway from Boston to Burlington via Manchester, Concord, White River Junction, and Montpelier is lighted as far as Concord; and the airway to Maine is lighted only as far as Portland. If regular transport night service were established over the two latter routes, it would be greatly handicapped without night-flying facilities; in fact, the lack of such equipment along the New Hampshire-Vermont route is one of the reasons for the daylight return-trip from Burlington, as it is essential for the

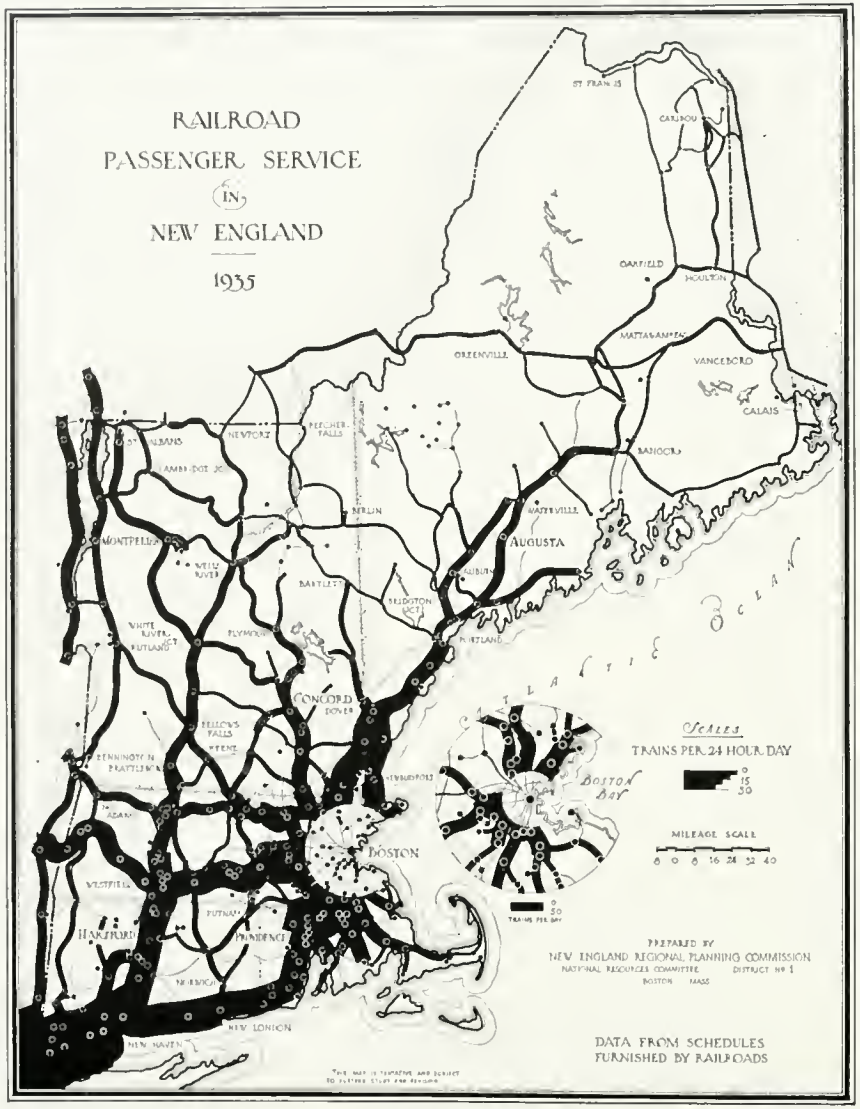


FIGURE 87

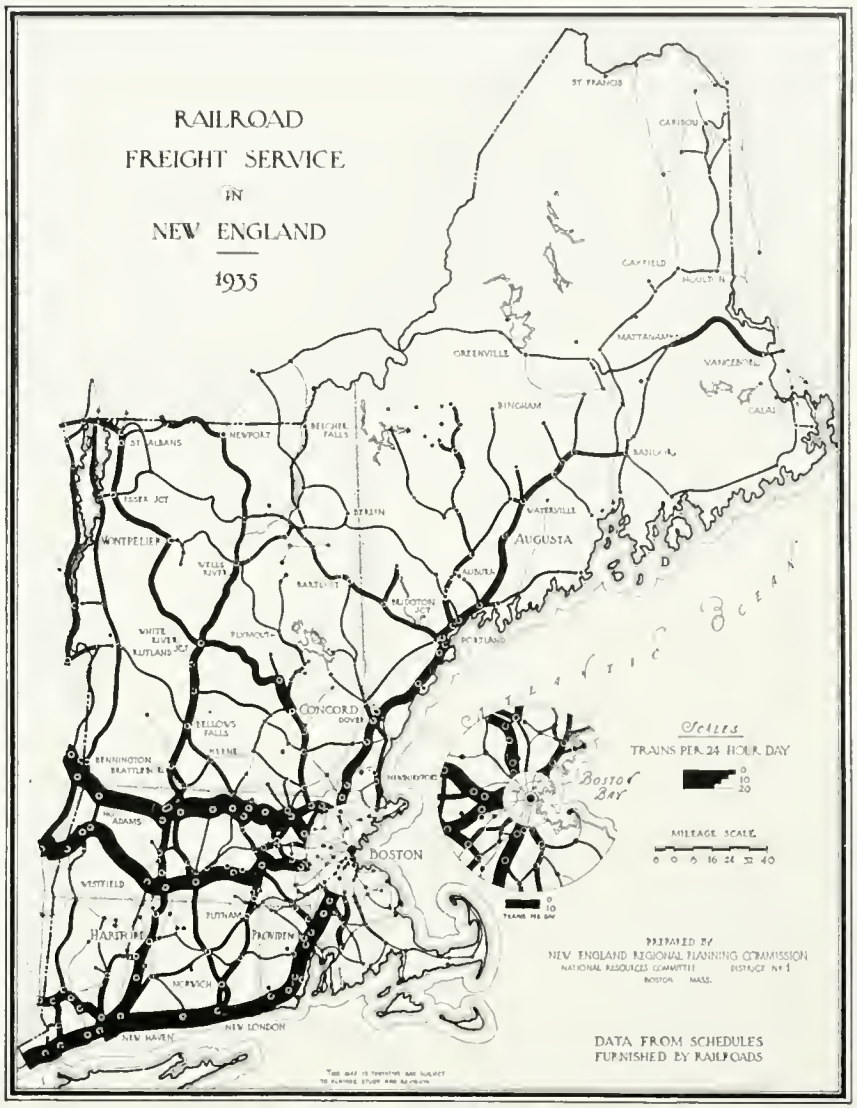


FIGURE 88

plane to reach Concord and the lighted airway before dark. Future flying will require the addition of numerous beacons on all New England air routes.

Aviation Committee.—The Commission does not intend to propose a grandiose scheme of development upon which public money might be squandered, but it does intend to develop, with the advice of its aviation committee a coordinated plan so sound economically and physically that it will attract and enlist the continued cooperation of all interested agencies and will serve to prevent unnecessary expenditures.

The aviation committee is composed of leading New England citizens, representing the States; the United States Army, Navy, and Bureau of Air Commerce; and various branches of aeronautic science.

Need for Regional Planning.—Transportation is a vital factor in the development of any region. Because of the inherent characteristics of aviation (long flights between widely spaced terminals), the problems of the physical and social aspects of air transportation in such a small area as New England transcend State lines and can be best studied from a regional point of view. Much money, public and private, has been invested in aviation, and more will be so spent in the future. That such investments may be protected, and that the public may secure the best service from air transportation, a program should be formulated whereby future developments may take place in an orderly and efficient manner. While this program may not be possible of immediate realization under any one agency or authority, it should be at hand for guidance whenever future aviation development is undertaken.

Railroads

New England railroads of today have developed through the consolidation of many small individual lines. Most of the original roads were constructed to meet contemporary demands for better local transportation, and not to create inducements to speculation in the development of additional areas. A few, however, were designed to tap outside traffic routes; for example, the Western R. R., now a part of the Boston and Albany system. The completion of this in 1841 gave Boston direct rail service to Albany. This link, built almost 10 years before the opening of the Hudson River R. R., which ran from New York to Albany, was of great importance to New England, as it helped to offset the natural advantage which the Mohawk-Hudson trade route gave to New York.

Between 1830 and 1850 came the greatest development of New England railroads. Following the Civil War, additional construction and a series of consolidations produced by the beginning of the twentieth century the major New England railroad systems substantially as they are today.

The following excerpt from the Interstate Commerce Commission Reports, 1918; volume 49, page 421, describes the outstanding characteristics of the railroad systems of New England:

> The transportation problem of New England is in many respects distinctive. This grows in part out of geographic conditions and to a still greater extent out of industrial and economic conditions. The New England lines serve directly almost none of the territory outside of New England, and they must depend in considerable part, so far as freight traffic is concerned, upon the tonnage interchanged with their rail connections to the west and north and with steamship lines serving the New England ports. For these reasons, and because they participated in only a part of the haul on through freight traffic into and out of New England, the New England lines have sometimes been referred to as mere terminal or switching railroads, a statement that is misleading if strictly interpreted, but not wholly without value as suggesting a reason for some of the difficulties encountered by these carriers. Another unusual feature of the New England situation is the character of the freight traffic. In no other section of the country does so large a percentage of the tonnage consist of high-grade manufactured products.
>
> Barring products of the forest and of the quarries the outbound movement of raw materials from New England is almost negligible. New England's industrial life depends largely upon importing large quantities of iron, cotton, wool, and other raw materials from the west and south and converting them into finished products. Power used in New England for these manufacturing processes is mainly derived from coal originating outside of New England and transported substantial distances by rail or water. It is estimated that for every three carloads of manufactured products moving west from New England five carloads of raw materials move eastbound into New England. Consequently there is a heavy movement of empty cars from New England to the west.

Courtesy B. & M. R. R.

FIGURE 89.—Streamline trains designed for speed, safety, and comfort are being included in New England railroad equipment.

Passenger Traffic.—In 1930 New England railroads carried approximately three times as much passenger traffic per mile as the railroads of the country as a whole. The recent decrease in this passenger business (37 percent from 1920 to 1930), probably due to the increase in highway travel, created a serious problem for the railroads.

Passenger traffic, 1930[1]

Item	United States	Eastern district	New England	Percentage New England of—	
				United States	Eastern district
Passengers carried, millions	704	531	89	12.6	17.1
Passenger miles, do	26,823	15,376	2,520	9.1	16.4
Passenger revenue, millions of dollars	729	404	70	9.6	17.3
Miles per passenger per road	38.1	29.5	28.4		
Revenue per passenger mile, cents	2.72	2.62	2.79		
Passenger miles per mile of road per day	326	805	993	304.6	123.4

[1] From monthly statistical reports of Interstate Commerce Commission.

The railroads are now making strenuous attempts to meet modern competition. Installation of new equipment has reduced running time on main lines; use of streamlined diesel-powered trains on the New Haven and the Boston & Maine has increased operating speed and thereby much traffic that had been diverted to other means of transportation has been returned to the railroads.

Freight Traffic.—The railroad freight traffic of New England is characterized by its high porportions of manufactured products and less-than-carload shipments of miscellaneous freight.

Courtesy B. & M. R. R.

FIGURE 90.—The Diesel-powered unit is a modern acquisition to provide greater rail service in New England through more economical operation.

Revenue freight carried in 1930[1]

[In millions of tons]

	United States		New England		Percentage New England of total
	Tons	Percentage	Tons	Percentage	
Products of:					
Agriculture	211.0	10.23	11.8	14.99	5.59
Animals	41.1	1.99	2.3	2.96	5.60
Mines	1,098.6	53.25	23.4	29.81	2.13
Forests	130.7	6.33	6.0	7.58	4.59
Manufacture and miscellaneous	530.4	25.71	29.8	37.91	5.62
Less-than-carload	51.3	2.49	5.3	6.75	10.33
Total	2,063.1	100.00	78.5	100.00	3.80

[1] Interstate Commerce Commission, annual statistical report.

Since industrial centers are located in southern New England, freight traffic is relatively heavy on the southern lines. Relative frequency of freight service on the entire railway system as of time tables in force January 1, 1935, is shown in figure 88.

William J. Cunningham, professor of transportation at Harvard University, has pointed out another distinctive characteristic of New England railroad freight traffic: "For the country as a whole in 1930 the average haul per ton per railroad was 186 miles. The comparable figure for New England was 119 miles. Ordinarily, the terminal cost per ton is much greater than the line cost, and the former is independent of distance. The terminal cost in New England is spread over a line haul of 119 miles, while for all railroads it is distributed over 186 miles. For a given amount of traffic the New England railroads, as a whole, therefore, must assume a terminal burden 56 percent greater than is assumed by the carriers as a whole."

Studies of New England Railroad Problems.—Various agencies have investigated New England railroad problems. The Commission has studied available surveys and has prepared preliminary maps and surveys for use by its transportation committee, soon to be appointed. A summary of outstanding studies and recommendations relative to New England railroads follows:

The Transportation Act of 1920 gave a mandate to the Interstate Commerce Commission to prepare a plan for consolidation of the many individual railroads of the United States into a limited number of systems, in order to simplify the task of rate regulation by eliminating the weak railroad.

The Interstate Commerce Commission, in its tentative report of 1922, suggested two plans for New England, but expressed no preference. The first, known as the trunk-line plan, would have left the Canadian-

controlled lines and the Boston & Albany R. R. (leased to the New York Central) undisturbed, and would have allotted the other New England railroads to two new trunk-line systems. The second, known as the New England regional plan, would have made no change in the status of the Boston & Albany, the Central Vermont, the Grand Trunk, and the Canadian Pacific railroads, but would have consolidated the remaining roads into one regional system.

The six New England governors, recognizing the need for studying the railroads on a regional basis, appointed a joint New England railroad committee to assist them in determining a policy for New England railroad consolidation. In 1923 this committee made an exhaustive report entitled, "Rehabilitation by Cooperation—A Railroad Policy for New England", of which the major conclusions were:

1. That New England railroads should be treated as a single regional group and not as extensions of trunk-line systems.

2. That immediate steps should be taken through the cooperation of all parties toward rehabilitating the New England railroads.

This report was submitted to the Interstate Commerce Commission as the recommendation of the New England governors.

In 1929 the Interstate Commerce Commission issued a final report in which it recommended for New England two independent systems. The plan for the northern system provided for consolidation of the Boston & Maine, Maine Central, Bangor & Aroostook, Delaware & Hudson, and a part of the Rutland Road. The nucleus of the southern system was to be the New Haven to which the plan added the New York, Ontario & Western, and the bridge lines, the Lehigh & Hudson, and Lehigh & New England. The present status of the Boston & Albany and Canadian-controlled railroads in New England was to be left undisturbed.

From 1928 through 1930, the Pennsylvania R. R. and the Pennroad Corporation made large purchases of the stocks of the New Haven and Boston & Maine Railroads. At the suggestion of the New England Council, the governors of the six New England States appointed, in the fall of 1929, a committee to make a study of the problem created by the Pennsylvania Railroad's direct and indirect ownership in the New Haven and Boston & Maine Railroads. This committee made a comprehensive study and came to approximately the same conclusions as the earlier committee—that it was not advantageous for the New England railroads to be consolidated with the trunk lines. The committee recommended that if the New England railroads should be consolidated into one group, the resulting consolidation should be free from control by the Pennsylvania R. R. or by any other trunk line. Rhode Island representatives on the committee submitted a minority report supporting a plain for allotting the New England railroads among four trunk-line systems. This plan was placed before the Commission in 1931 by the Pennsylvania, New York Central, Baltimore & Ohio, and Chesapeake & Ohio-Erie managements.

Following the report of this committee in 1931 the governors appointed a new committee, consisting of one member from each State. This committee has represented the governors in various proceedings before the commission in connection with the problems created by the Pennsylvania's ownership. At present the Interstate Commerce Commission has on its docket, at the request of the New England governors, an investigation of the probable results of this ownership. The investigation, however, has not been pressed, presumably on account of the situation created by the weakness of the New Haven R. R., which on October 23, 1935, filed a petition for reorganization under section 77–B on the National Bankruptcy Act.

Photo courtesy of United States Army Engineers

FIGURE 91.—The use of the Cape Cod Canal facilitates rapid shipping movement between Boston and Southern ports.

Waterways and Ports

While study of the New England port and waterways problem is included in the long-term program of the Commission, work to date has been confined to the assemblage of data on the subject.

New England was the first center of shipping in this country. Its long, harbor-dotted coastline made it natural for the early settlers to engage in maritime industry and transportation. The 30-ton *Blessing of the Bay* was launched on July 4, 1631, only a year after Boston was settled. By 1700, 194 ships were owned in Boston as against 124 in New York. The golden age of New England shipping came, however, during the first half of the nineteenth century, when the famous wooden clipper ships of that period supplied the medium for foreign trade and enabled New England to attain a position of prestige in manufacturing. So great was the success of this type of ship that many New England leaders believed that in the great trade lanes it could never be replaced. Due to this erroneous conviction and to the coming of the Civil War, the supremacy of New England in foreign shipping ended, and from 1875 to the outbreak of the World War American shipping as a whole declined. The impetus given to shipping during the World War and by the act of 1920, which recognized the importance of maintaining an adequate merchant marine, was responsible for a new era in maritime industry.

Most of the important rivers and harbors in New England are being improved and maintained by the Army engineers. In addition to these, many improved natural harbors afford additional protection to shipping. The water-borne commerce handled through these ports in 1934 amounted to 19,044,935 tons, 5.3 percent of the United States total. The value of this tonnage was $863,730,119. In addition, 3,301,565 tons of freight valued at $71,142,896 was transported in 1934 on the navigable rivers of New England.

The domestic coastwise trade of New England is of more significance than direct foreign trade. Domestic cargoes received and shipped are almost five times as great as foreign imports and exports. However, much domestic trade with New York consists of New England products for ultimate export and of imports for distribution in New England.

The construction of the Cape Cod Canal provided for coastwise trade a safer and shorter waterway between northern New England ports and those to the south. The original channel, 100 feet wide and 25 feet deep, has since been widened to about 200 feet. At present, work is under way to provide, eventually, a channel over 500 feet wide and 32 feet deep. Upon completion of this channel, all shipping now routed around Cape Cod can move safely and directly to southern ports.

New England industries import many raw materials from foreign countries and export divers products to foreign markets. Due to the bulk of the raw material as contrasted to that of the manufactured product, the amount of import trade handled in New England ports greatly exceeds the export. There is imperative need of bulk cargoes for export. Since at present more than 66 percent of the exports and over 50 percent of the imports of New England move by way of New York, the actual amount of merchandise passing through the New England customs districts is not a reliable guide to the importance of her foreign trade.

A new steamship line between New England and Europe, to be controlled and operated by New England interests, is under consideration. Hearings on petitions to promote such a line are being held by the Secretary of Commerce. The plans call for passenger and freight steamers to be operated from New London, Providence, Boston, and Portland to London and Hamburg.

According to a report made by Frank S. Davis, manager of the Maritime Association of the Boston Chamber of Commerce, there is evidence of a definite and substantial up-turn in the business of New England shipping and allied industries. Business handled by the Boston coastwise steamship lines was greater during October 1935 than in any single month in recent years. Intercoastal lines operating through the Panama Canal have found it necessary to put extra vessels into service between west-coast ports and Boston. Foreign imports far exceed those of corresponding periods in recent years.

Public understanding of the importance of New England port development is essential to the sustained prosperity of the region. The New England Regional Planning Commission provides the opportunity for cooperative action among the several States in the study of their common problems pertaining to the development of their major ports and waterways.

STAFF REPORT—SECTION VI
INDUSTRY

New England is the birthplace of American industry. This fact is due to the natural circumstances and obstacles that faced the settlers of the region. Handicapped by a lack of acreage suitable for large-scale farming, they turned to their resources of forests and fisheries. These constituted the foundation of the shipbuilding and overseas trade that led to a profitable world-wide commerce. Lack of essential raw materials and scarcity of hired labor barred the production of staples that would have served as a basis of exchange for old-world manufactured goods. Consequently, these pioneers were forced to rely on their native skill in inventing and producing articles for their own needs. Surplus products were exchanged at home and abroad for goods and materials needed in New England. The increasing demands of a growing national population early led to factory methods of production that made New England the original industrial section of the country, and, for many years, its principal source of supply of manufactured goods.

Fisheries

Location on a coast adjacent to exceptionally large and abundant fishing grounds accounted for the establishment of New England sea fisheries as an essential industry. In Colonial days these fisheries not only supplied necessary food but were an important source of revenue. In addition, the fishing fleet played a large part in the development of New England shipping and world commerce. Today, the fishing industry of this region ranks higher than that of any other section of the country except the Pacific coast, and in 1933 it contributed over 13 million dollars to New England revenue. Combined with related food industries, it provided employment for nearly 29,000 people. Although not a dominant economic factor, the fishing industry of New England is an essential element of its economic life and is, moreover, a major source of food supply for the entire country. The importance of the industry justifies its inclusion in any program for the development of regional resources.

Photo courtesy of New England Council

FIGURE 92. From the earliest days industrial plants have been located along the river banks to take advantage of the vast natural water resources.

Courtesy of the Boston Evening Transcript

FIGURE 93. A few of the boats typical of the great fishing fleet which has brought to New England an international reputation in the fishing industry

Mineral Industries

Although coal and metallic ores are found in New England in negligible quantities, the granite, marble, slate, and mica deposits are valuable commercial assets. In combination with other rock and clay resources and allied industries, they are important to the economic life of the region, and in Vermont constitute the principal industry. New England quarries supply a substantial proportion of the marble and granite used for building and monument construction throughout the country. While mineral production does not contribute

Courtesy of the New England Council

FIGURE 94.—New England's stone quarries constitute an important element in the industrial structure

a relatively large portion of New England income, it is an important feature of the industrial life and a vital economic factor in many communities of this section. These resources hold possibilities in the development of new uses and new markets for their products.

Manufacturing

Notwithstanding the relatively small quantities of raw materials and natural resources, and remoteness from sources of supply, New England is fortunate in its large per capita wealth with plenty of capital available for investment in industry. This investment, in turn, has made manufacturing the foundation of its industrial structure, and hence its principal source of revenue.

Its manufacturers have always produced high-quality goods and have shown great resourcefulness in changing methods and shifting from one industry to another as need arose. They have shown great skill in management and have been fortunate in having in their employ the highest percentage of skilled mechanics and laborers in the country.

In its position as the oldest manufacturing region in the Nation, New England reached a stage of industrial maturity earlier than other sections. Approximately two-thirds of the 310 distinct lines of national manufacturing are represented in New England today. To maintain its high industrial rank and solve the problems arising from changing conditions in the cycles of industrial development, a searching analysis is essential. As a basis for the study of these problems and for future plans, an outline of the status and trend of New England industry is presented.

Importance of Manufacturing in New England.—The important place held by manufacturing in New England today is attested by the fact that it provides over 50 percent of the region's salaries and wages and employs 43 percent of all wage earners. It leads all other classes of occupations by a wide margin.

TABLE XVII.—*Principal classes of occupation in New England, 1930*

[United States census, 1930]

	Wage earners	
	Numbers	Percent
Manufacturing and mechanical industries	1,478,958	43.1
Trade	438,947	12.8
Clerical occupations	346,194	10.1
Domestic and personal service	343,517	10.0
Transportation and communication	253,056	7.4
Professional service	252,268	7.4
Agriculture, forestry, fishing, mining	241,245	7.0
Public service	76,971	2.2
Total	3,431,167	100.0

The revenue from manufacturing far exceeds that from other major wealth-producing activities in its

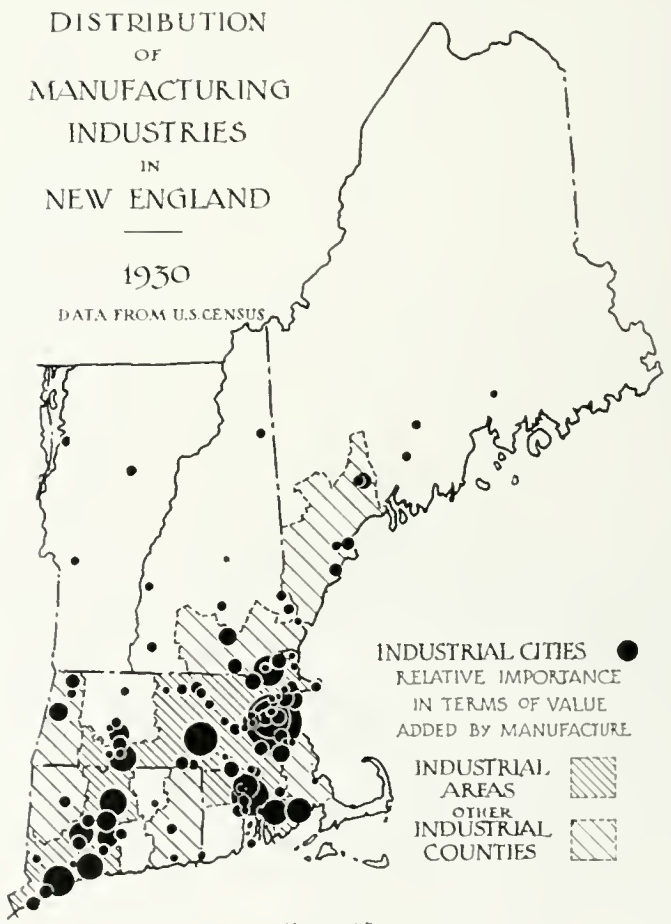


FIGURE 95

value of products, $3,073,000,000 (1933), as compared with the value of agricultural products, $361,000,000 (1929), and recreational expenditures, $500,000,000 (1935).

Additional evidence of the high rank of the manufacturing industry in this region is that throughout the nineteenth century a large percentage of the goods manufactured in the United States was made in New England. At the beginning of the twentieth century, New England had 22,600 factories, employing 852,000 workers, who produced goods valued at $1,660,000,000; in 1933, New England had 14,000 factories, employing 798,000 workers, who produced goods valued at $3,073,000,000.

In 1929, although having less than 7 percent of the United States population, New England's portion of the Nation's manufactured output, by value of product, was 9.1 percent; in 1931, 9.5 percent; and in 1933, 9.8 percent. This rise in proportion to the total output of the United States indicates that in New England, where the share of the national total dropped from 60 percent to 9 percent in the past century and a quarter, the tide is turning.

Distribution of Manufacturing Activity.—The manufacturing activities of New England are concentrated largely in Connecticut, Massachusetts, Rhode Island, and southern New Hampshire and Maine, as shown by the accompanying map. The industrial areas, as

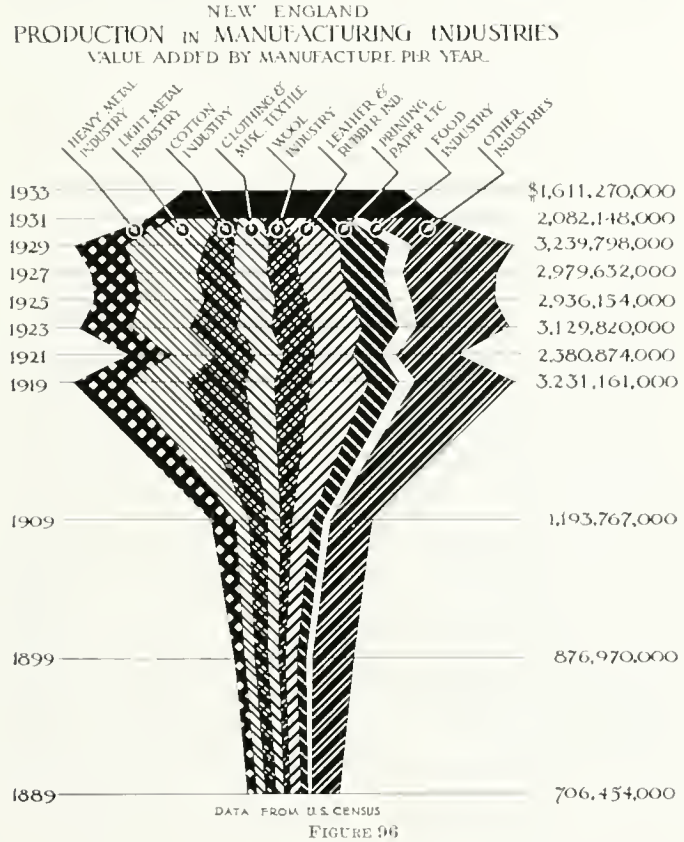


FIGURE 96

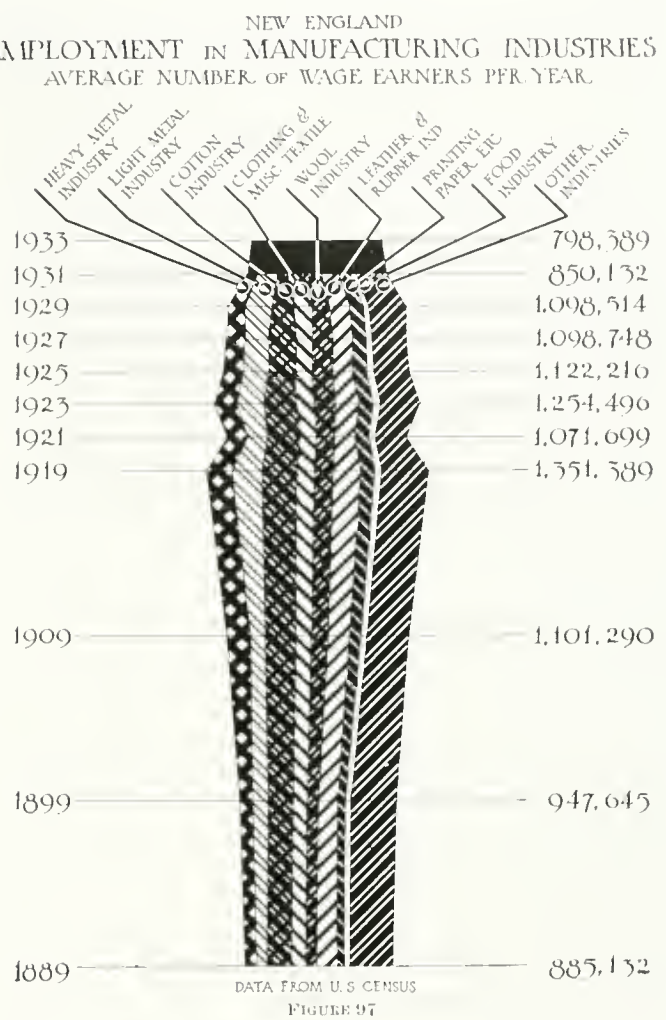


FIGURE 97

defined by the Census Bureau and indicated on the map, account, with respect to the entire region, for three-fourths of the production value and the wage earners engaged in manufacturing. Outside these areas are other counties and cities of industrial importance; also there are many small industrial communities which for want of adequate data are not indicated on the map. The distribution of wage earners by States, including those without as well as within the industrial areas, is outlined in table XVIII.

TABLE XVIII.—*Wage earners in manufacturing, 1930*
[United States Census, 1930]

	Percent of total wage earners in state
Maine	36.7
New Hampshire	46.4
Vermont	29.3
Massachusetts	42.6
Rhode Island	51.0
Connecticut	45.7

Classes of Manufacturing Industries.—Because New England is so generally associated in the public mind with textiles, the opinion is prevalent that the textile

industry is its principal manufacturing activity. Yet the metal industries group holds the highest rank as measured in value added by manufacture, with textiles second. The latter group, however, ranks highest in percentage of wage earners. These two lead the other classified groups in manufacturing value by a considerable margin, as shown in table XIX. The unclassified group constitutes nearly one-quarter of all manufacturing activities—more than the entire textile industry. It is an important group, as it represents a large number of miscellaneous industries of small average size which in the aggregate provide employment for about 22 percent of the industrial wage earners. Diversified manufacturing, constituting the greater portion of the unclassified group, is a significant characteristic of industry in New England.

TABLE XIX.—*Relative production value and employment in major industrial groups—Average of 1929 and 1931*

[United States Census of Manufactures]

	Percent of total value added by manufacture	Percent of total wage earners in manufacturing
Metals and related industries	27.4	23.4
Textiles	21.9	31.3
Paper and printing	11.2	7.7
Leather and rubber	9.7	12.1
Foodstuffs	5.9	3.6
Unclassified	23.9	21.9
Total	100.0	100.0

In addition to its leading rank in value added by processing, the metal industries class holds first place by contributing nearly one-half of the total net profit credited to the major manufacturing groups. Textiles, on the other hand, account for only about one-twentieth. This contrast indicates the importance of New England's supply of labor skilled in metal and allied trades and the desirability of expansion in this field.

Industrial Trends.—The trend of principal classes of manufacturing industries from 1889 to 1933 is shown in chart form for number of wage earners and for value added by manufacture. Both factors increased steadily until 1919. Over the next decade the total volume of production held its place, with variations in certain classes of industries. Although employment figures show an over-all decline from 1919 to 1929, which reflects labor displacement in manufacturing operations—a situation common to the entire country, several classes of industry maintained a high employment level. The well-sustained trend of both production and employment in the miscellaneous industries class is significant, because this group reflects the prevalence of comparatively small industries in this region.

Conclusion

During the period of national industrial activity ending in 1929, 104 New England industries showed a downward trend while 88 made consistent progress in both production and employment. Twenty-eight other industries neither gained nor lost in national rank. Inevitable changes in the growth and progress of both people and country have brought about many of the conditions in 104 lines of manufacture that require readjustment. Although there are about 220 lines of manufacturing common to the New England region as a whole, greater diversification is essential in various localities to the maintenance of a high degree of employment. Ample opportunity for intro-

Courtesy of the Boston Evening Transcript

FIGURE 98.—Shipbuilding utilizes products of New England's highly developed mechanical industries

Courtesy of the United Shoe Machinery Corporation

FIGURE 99.—One of the many well-equipped shops, typifying New England's most important class of manufacturing high grade machinery products.

ducing new industries is presented in New England in a foundation of skilled labor, capable management, large markets, and capital resources—all essential for manufacturing enterprise.

For the promotion of industrial development, the New England Regional Planning Commission is cooperating with all interested agencies. The planning boards of the New England States have expressed a common purpose with respect to their manufacturing industries and include in their programs as a principal objective the study of conditions and the promotion of industrial readjustment and expansion. The New England Council, representing, among other economic interests, the industries of the region, is active in efforts to advance their growth and progress.

The Commission is not prepared at this time to submit a detailed report on manufactures on account of the limited extent of its investigations. Its work in this field has been confined principally to the assembling of statistics showing the status and relative position of the manufacturing industries in New England. The Commission will continue to study industrial data and trends, and to participate in efforts to promote industrial growth throughout the region.

STAFF REPORT—SECTION VII
PUBLICITY

The New England Regional Planning Commission has considered it necessary to disseminate in New England, more widely than has ever been done before, definitions of sound planning and statements as to what planning can accomplish. Proper publicity as to the benefits of planning is justifiable. Propaganda is considered unnecessary.

In New England there are innumerable organizations with interests centering about particular phases of civic life. Most of these bodies have had little opportunity to relate their efforts to those of other groups concerned with and interested in logically associated subjects. The Commission believes that an understanding attitude and active cooperation on the part of such organizations and of the public is fundamental to successful publicity. In turn, intelligent publicity will facilitate the execution of a sound regional plan. Therefore the Commission has employed various means to arouse interest in and encourage discussion of planning in New England.

Conferences

The first general meeting in which the commission took part was the Northeastern Planning Conference held in Concord, N. H., in April 1934. The Hon. Frederick A. Delano, chairman of the National Planning Board, presided, and more than 80 people representing State departments, national, regional, State, and local planning organizations throughout New England were present. Victor M. Cutter, then acting chairman of the Commission, defined the organization as the coordinator for the State planning boards of New England, its objectives being to stimulate interest in planning from the regional standpoint and to carry on surveys leading to the development of plans distinctly regional in character.

On March 22, 1935, the Commission sponsored a conference of representatives of New England agencies concerned with water resources to discuss interstate river problems, especially those regarding the Connecticut, Blackstone, and Merrimack Rivers. This meeting brought out the desirability of having a technical water resources committee to assist the commission, and resulted in the appointment of such an advisory group.

To the fourteenth meeting of the Commission, held October 31, 1935, were invited Charles W. Eliot, 2d, executive officer of the National Resources Committee, and all the members of the six State planning boards in New England. Mr. Eliot asked the assembly to sound the public mind of New England and then to develop, from the New England standpoint, a technique for interstate cooperative action.

At the tenth anniversary conference of the New England Council, held in Boston November 21 and 22, 1935, the opening session was devoted to the subject of State and regional planning in New England. The governors of New England, at the Eastern States Exposition last September, had voted to have a meeting with the State planning boards, the New England Regional Planning Commission, and the presidents of State colleges for consideration of New England problems. The plans of the several groups were combined, and the cooperative meeting constituted the first session of the conference. The purposes of the Commission were presented in its "Objectives for New England", and the programs of the several State boards in statements of tentative plans which they had drawn up.

Monographs and Reports

From time to time the Commission has issued reports on its activities. More than 15,000 copies of these reports have been distributed through various channels in the past 2 years.

In September 1934, a population study of New England was prepared. After being reviewed by several members of the advisory committee, the report was revised, sent to the State planning boards, and made available to other organizations concerned with population problems.

In March 1935, the Commission staff prepared a monograph on modern highway design. Through the cooperation of the New England Council, this was published and sent to the entire advisory committee of the Commission, the total membership of the Council, and, upon request, to many interested individuals.

The 1935 report of the Commission—Basic Data for a Tentative and Preliminary Plan for New England—was issued in June. This report contained summaries of studies made to that time, including highways, recreation, and water resources. Each member of the advisory committee was requested to present his copy of the report, if not needed for personal use, to some library, preferably a local one. By this means data

relative to New England planning has been placed in many libraries throughout the region.

At the tenth anniversary conference of the New England Council that organization issued a publication entitled "New England Today." In this was included much material assembled by the Commission, comprising charts and maps that showed conditions in all phases of New England life.

Public Addresses

Another important approach to the public has been through talks at meetings of various groups interested in planning. The chairman and consultants of the Commission have addressed more than 65 such gatherings. Among these were chambers of commerce, garden clubs, planning boards, societies for the protection of forests and natural features, Laymen's Leagues, Lions Clubs, Rotary Clubs, fish and game clubs, and federations of planning boards. These addresses have played an important part in acquainting the New England public with the purposes and activities of the Commission.

News Stories and Magazine Articles

The Commission has received valuable publicity on the meaning and objectives of planning from metropolitan papers and weekly journals through published reports. Technical publications have carried special articles on planning written by members of the Commission staff.

New England Planning Bulletin

On September 18, 1935, the Commission authorized as an experiment, the publication of a New England Planning Bulletin to be issued monthly for the coming half-year. This publication is not designed to replace technical reports and statistics; its purpose is limited to giving a brief résumé of a few of the highlights of planning in New England.

Exhibits

On several occasions maps and charts produced in the course of the planning work of the Commission have been displayed at small group meetings, and last summer a permanent and comprehensive exhibit was prepared. This colorful exhibit, assembled in collaboration with the State planning boards, illustrates significant facts about population, agriculture, industry, recreation, flood control, water resources, aviation, highways, railroads, and grade crossings in New England. An outstanding feature is a model of the entire Connecticut Valley from Canada to Long Island Sound. (A copy of the model is being prepared for use by the Flood Forecasting Service of the United States Weather Bureau at Hartford, Conn.) This exhibit was first used at the Eastern States Exposition in Springfield, Mass., September 15-21, 1935. Later it was shown at several colleges and at the New England Conference, and since then has been set up for permanent display at the headquarters of the Commission.

Clearing House for New England Information

To avoid duplication in preliminary research for planning, the Commission staff has prepared bibliographies of material already collected by other organizations. There are on file to date references to data on the Connecticut, Merrimack, and Blackstone Rivers; on aviation; and on recreation facilities. The staff has also done original research in specific fields. All the above-mentioned information is available to any agency that is contemplating making a survey.

The value of this procedure appears in the use already made of the collected data by such departments as the National Park Service, the Army engineers, and local and State planning boards.

Stimulation of Planning in New England

The Commission has constantly kept in touch with the various planning agencies and the members of its advisory committee in regard to local planning. On 234 occasions, officials of 90 planning boards and indi-

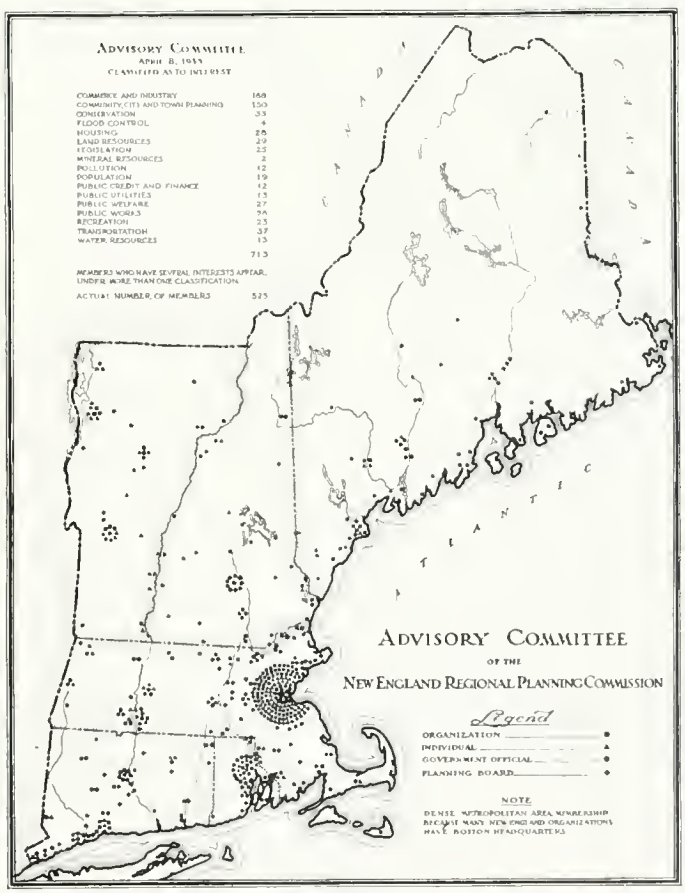


FIGURE 100

vidual citizens have been rendered assistance. Since the establishment of the State planning boards, requests for assistance in local planning have been referred to them. Several new regional planning associations have been organized as a result of the interest in planning stimulated by the Commission, and more than 5,000 items of material have been supplied in response to requests from all over New England.

Advisory Committee

The formation of an advisory committee was early decided upon by the Commission. From that standpoint, consideration of the committee might well have headed a report of publicity procedure. For equally valid reasons, this discussion has been reserved till the last. The Commission believes that the most significant phase of its publicity program is the establishment of an active advisory committee. The help of an interested, well-informed, cooperative committee is its most valuable asset in maintaining contact with the New England public and in securing the proper publicity for a regional plan. All other means of arousing public interest, however good, are mechanical, and it remains for the people of the advisory committee literally to make regional planning a living issue for all the rest of the people who make up the New England public.

FIGURE 101.—A panel of a permanent exhibit prepared by the New England Regional Planning Commission

The membership includes government officials, engineers, architects, landscape architects, lawyers, bankers, officers of chambers of commerce, commissioners of public works, fish and game officials, merchants, manufacturers, representatives of park and forest associations, and many other individuals interested in planning. The members have unanimously approved regional planning for New England, and in response to requests for advice and information have cooperated wholeheartedly; in many cases they have voluntarily contributed constructive suggestions. At present this committee comprises 546 members distributed throughout New England as follows:

Connecticut	68
Maine	62
Massachusetts	259
New Hampshire	50
Rhode Island	43
Vermont	51
Outside New England	13
Total	546

(The large membership from Massachusetts is due to the fact that many New England organizations have their headquarters in Boston.)

This committee does not meet as a whole, but small groups in the various professions or with specific interest in individual phases of the Commission program are approached for criticism and comment when specific occasion arises. Committee members have stated their interest in the following subjects (some individuals have more than one interest):

Commerce and industry	192
Community, city, and town planning	149
Conservation and recreation	62
Housing	112
Land resources	32
Public utilities, finance, and legislation	51
Public welfare and population	19
Public works	102
Transportation	121
Water resources	97
Total	970

Through its own efforts and through the cooperation of organizations and interested individuals the Commission is developing sane regional planning in New England. Through its advisory committee the Commission is interpreting sane regional planning to the people of New England.

STAFF REPORT—SECTION VIII
PLANNING AGENCIES IN NEW ENGLAND

There has been for many years widespread interest in town planning in New England, expressing itself both in unofficial groups and in official organizations. It has not always been identified by the name "planning", for it took its start from interest in objectives, and developed later interest in methods.

The colonial New England village has offered an ever-present example of the coordination of the physical development of the community with the community life—the aim of planning. Wide and beautiful tree-shaded streets; the "green"; the community church, school, and town hall grouped about it; these have made the New England village famous.

Interest in town planning as such came from the realization that proper growth of modern communities, large and small, requires more conscious, direct provision and control of development than has been common in the past.

Official Recognition of Planning

One of the first official acts in New England leading to the recognition of planning as a regular function of town and city government was the creation in 1913 of the Homestead Commission of Massachusetts. This commission secured the enactment of a law requiring towns and cities of 10,000 people or more to create planning boards, and granting to towns under 10,000 in population the power to create local planning boards. According to the law these boards "shall make careful studies of the resources, possibilities, and needs of the town." Today, municipal planning enabling acts are in effect in Connecticut, Rhode Island, New Hampshire, Vermont, and Massachusetts.

Local Planning Agencies

The Commission, through the cooperation of the State planning boards, is now completing a survey of local planning agencies in New England. This survey shows a total of 207 municipal planning boards.

This is an increase of 36 over the total of 171 boards which were in existence in January 1931, the date of a survey conducted by field representatives of the National Planning Board. In proportion to the establishment of only about 70 new boards between 1925 and 1934, an increase of 36 in the last 2 years is significant.

In general, planning agencies in New England have operated in a modest way, carefully preparing plans for local development, making the most of meager financial support. In the survey just being completed only a third of the boards report budgets, and even these are small. During the past 3 years the relief activities of the Federal Government have provided staff assistance for many local planning agencies.

	Official boards	Unofficial boards	State total
Maine	1	14	15
New Hampshire	6	4	10
Vermont	5	1	6
Massachusetts	130	1	131
Rhode Island	11	0	11
Connecticut	32	2	34
Total	185	22	207

In addition to the officially constituted town and city planning boards, there are many unofficial groups engaged in furthering the ends of planning. These often function more effectively than could an official planning board. Sometimes these organizations are town improvement associations or town planning councils; often the local chamber of commerce has an active city planning committee. These unofficial groups have frequently secured the creation of official planning boards. No authoritative figures are available to tell the number of these groups, but it is well known that a great many do exist.

State Planning Agencies

During the last decade there has developed a gradual recognition of the need to plan in units larger than the town or city. Large expenditures for public works have been hastily made during the depression. Hence, State governments have realized the need for coordination of the programs of the various executive departments and for the preparation of a comprehensive plan for State development, to guide expenditure and guard against wasteful spending if another such emergency should occur.

Each of the six New England States now has a statutory planning board as a permanent part of its governmental organization. The laws establishing these boards were approved in each State as follows: New Hampshire, February 20, 1935; Rhode Island, March 21, 1935; Maine, April 6, 1935; Vermont, April

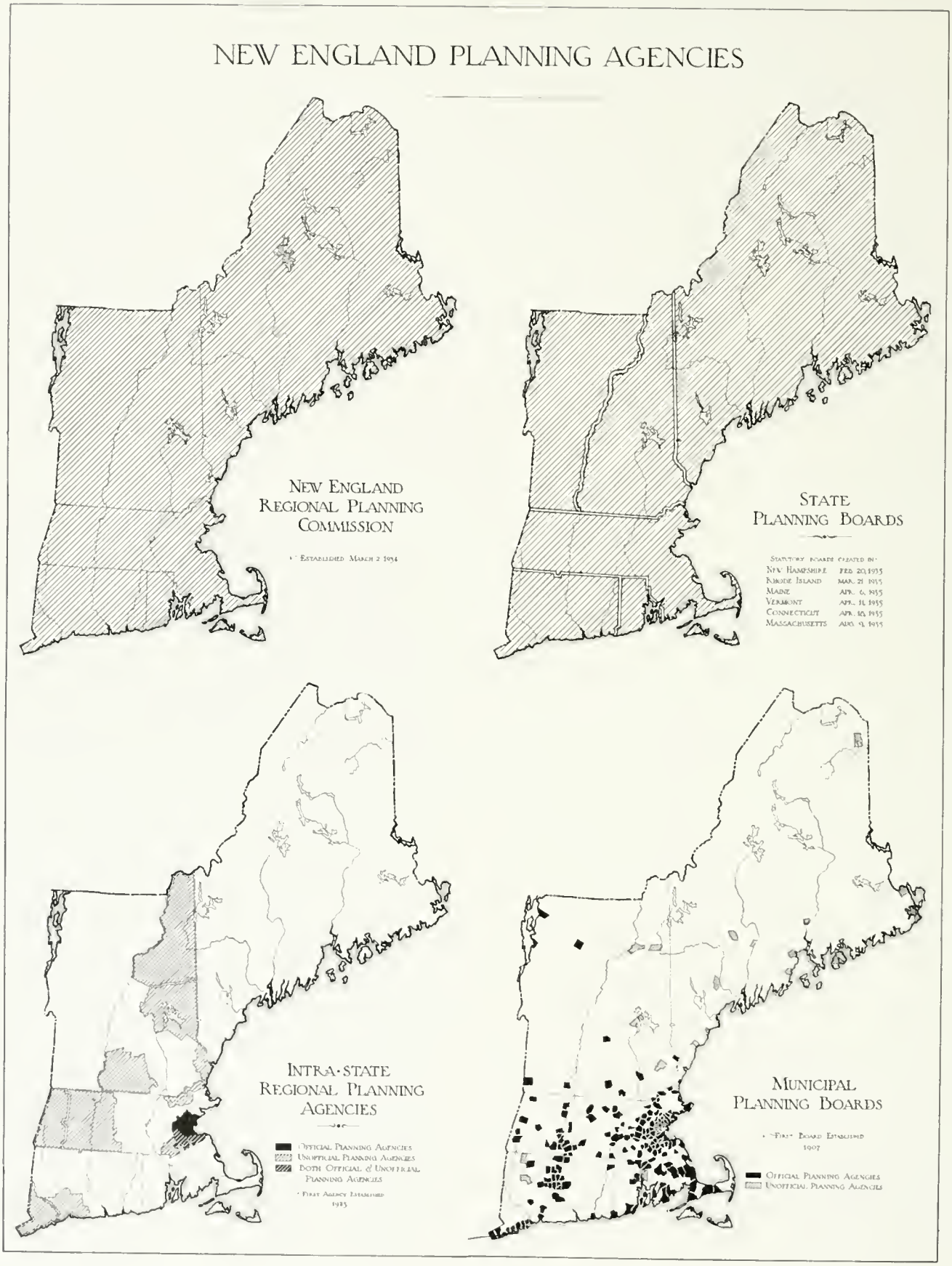

NEW ENGLAND PLANNING AGENCIES
NEW ENGLAND REGIONAL PLANNING COMMISSION
* ESTABLISHED MARCH 2 1954
STATE PLANNING BOARDS
STATUTORY BOARDS CREATED IN:
NEW HAMPSHIRE FEB. 20, 1935
RHODE ISLAND MAR. 21 1935
MAINE APR. 6, 1935
VERMONT APR. 11, 1935
CONNECTICUT APR. 10, 1935
MASSACHUSETTS AUG. 31, 1935
INTRA-STATE REGIONAL PLANNING AGENCIES
OFFICIAL PLANNING AGENCIES
UNOFFICIAL PLANNING AGENCIES
BOTH OFFICIAL & UNOFFICIAL PLANNING AGENCIES
* FIRST AGENCY ESTABLISHED 1935
MUNICIPAL PLANNING BOARDS
* FIRST BOARD ESTABLISHED 1907
OFFICIAL PLANNING AGENCIES
UNOFFICIAL PLANNING AGENCIES

FIGURE 102

11, 1935; Connecticut, April 18, 1935; Massachusetts, August 9, 1935.

The State planning boards are advisory in character. Their functions include the collection of planning data, the correlation of the State planning activities of State departments, and the formulation of plans for the wise use and orderly development of the resources of the State.

Regional Planning Organizations

As a further response to the need for planning in units of area larger than the municipality, there have been formed organizations concerned with the planning and development of regions not coincident with political boundaries, ranging in size from groups of towns to groups of States. Some are associations of official planning boards, others are societies of citizens interested in the development of their region. Examples of the former are the New England Regional Planning Commission and the Associated Planning Boards of Norfolk County, Mass. Examples of the latter are the Fairfield County (Conn.) Planning Association (a well-established organization of long standing), and the New England Town Planning Association. All of these agencies, official or unofficial, are advisory and without statutory power.

In addition to being organized differently, these bodies differ in the types of areas with which they deal: metropolitan districts, counties, river valleys, and groups of towns corresponding to physical subdivisions of a State. The following list includes all such organizations of comprehensive planning interest known to the Commission:

Interstate region:
- New England Regional Planning Commission.
- New England Town Planning Association.

State:
- Massachusetts Federation of Planning Boards.

Groups of towns, approximating a physical subdivision of State:
- Monadnock Region Association, New Hampshire.
- North Country Development Association, New Hampshire.
- Seacoast Regional Development Association, New Hampshire.
- Lakes Region Association, New Hampshire.
- Old Hampshire Planning Council, Massachusetts.

County:
- Fairfield County Planning Association, Connecticut.
- Associated Planning Boards of Norfolk County, Mass.
- Berkshire County Planning and Research Bureau, Massachusetts.
- New Haven County Planning Association, Connecticut.

Metropolitan District:
- Boston Metropolitan District Commission, Planning Division (established by State law).
- Hartford Metropolitan District, Commission on Regional Planning.

River Valley:
- Merrimack Valley Regional Association.
- Connecticut Valley Council.

STAFF REPORT—SECTION IX
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STAFF REPORT—SECTION X
PUBLICATIONS

PROGRESS REPORT TO THE NATIONAL RESOURCES BOARD ON THE MAKING OF A PLAN FOR NEW ENGLAND: April 1–October 1, 1934.

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BASIC DATA FOR A TENTATIVE AND PRELIMINARY PLAN FOR NEW ENGLAND: June 1935.

•

A PROGRAM OF LIMITED MOTORWAYS FOR NEW ENGLAND: October 1934.

•

LIMITED MOTORWAYS: March 1935.

•

STUDY OF A MODEL STATE ENABLING ACT EMPOWERING STATE HIGHWAY DEPARTMENTS TO CONSTRUCT AND MAINTAIN FREEWAYS AND PARKWAYS: Prepared by United States Bureau of Public Roads at request of New England Regional Planning Commission: July 1934.

•

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•

PROPOSED ENABLING ACT—Water Resources Committee: April 1935.

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•

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•

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•

SUMMARY OF STATE PLANNING BOARD LEGISLATION IN NEW ENGLAND: April 1935.

•

EIGHT OBJECTIVES FOR NEW ENGLAND: November 1935.

•

NEW ENGLAND PLANNING BULLETIN (published monthly): Vol. I, No. 1, issued October 1935.

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